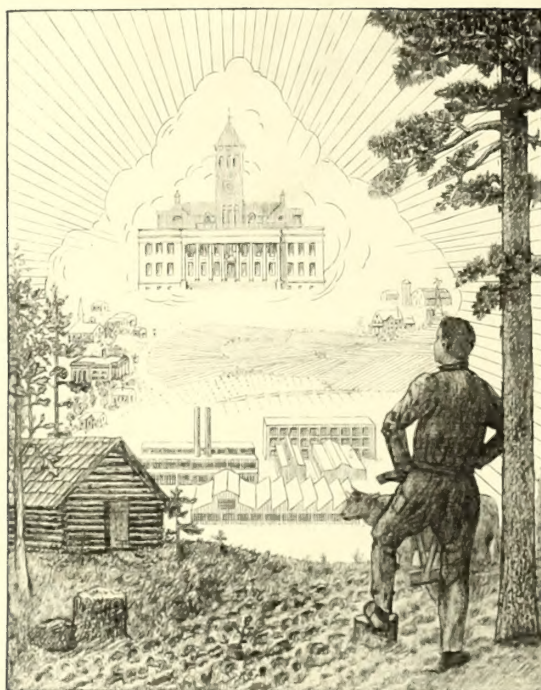


Clemson University



3 1604 019 981 838





## CLEMSON COLLEGE LIBRARY













Digitized by the Internet Archive  
in 2013

<http://archive.org/details/insectpestsurvey15bure>







THE INSECT PEST SURVEY  
BULLETIN

---

Volume 15

March 1, 1935

Number 1

---

BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING





# I N S E C T P E S T S U R V E Y B U L L E T I N

Vol. 15

March 1, 1935

No. 1

## REPORTERS FOR THE INSECT PEST SURVEY

United States	The Entomologists of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture
Alabama	Dr. J. M. Robinson, Alabama Polytechnic Institute, Auburn
Arizona	Mr. C. D. Lebert, P. O. Box 2006, Phoenix
Arkansas	Dr. W. J. Baerg, University of Arkansas, Fayetteville Mr. Dwight Isely, University of Arkansas, Fayetteville
California	Dr. W. B. Herms, University of California, Berkeley Prof. E. O. Essig, University of California, Berkeley Mr. S. Lockwood, Bureau of Plant Quarantine and Control, Department of Agriculture, Sacramento Mr. H. S. Smith, Citrus Experiment Station, Riverside Mr. H. J. Ryan, County Agricultural Building, Los Angeles Mr. D. B. Mackie, Department of Agriculture, Sacramento Mr. M. L. Jones, Department of Agriculture, Sacramento Mr. A. E. Michelbacher, University of California, Berkeley Dr. A. W. Morrill, 815 Hill Street, Los Angeles Mr. L. M. Smith, University of California, Deciduous Fruit Field Station, Route 1, Box 232, San Jose Mr. F. H. Wymore, College of Agriculture, Davis Mr. G. S. Hensill, University of California, Berkeley Mr. J. F. Lamiman, University of California, Berkeley
Colorado	Dr. C. P. Gillette, State Agricultural College, Fort Collins Dr. G. M. List, State Agricultural College, Fort Collins
Connecticut	Dr. W. E. Britton, Agricultural Experiment Station, New Haven Dr. E. P. Felt, Bartlett Research Laboratory, Stamford Dr. P. Garman, Agricultural Experiment Station, New Haven Mr. N. Turner, Agricultural Experiment Station, New Haven Mr. M. P. Zappe, Agricultural Experiment Station, New Haven
Delaware	Dr. L. A. Stearns, Agricultural Experiment Station, Newark
Florida	Dr. Wilmon Newell, Agricultural Experiment Station, Gainesville Mr. J. R. Watson, Agricultural Experiment Station, Gainesville Dr. E. W. Berger, State Plant Board, Gainesville Dr. H. T. Fernald, 707 East Concord Avenue, Orlando



Georgia	Mr. M. S. Yeomans, State Board of Entomology, Atlanta Mr. C. H. Alden, State Board of Entomology, Cornelia Mr. W. H. Clarke, Peach Experiment Station, Thomaston Mr. J. B. Gill, Box 572, Albany
Idaho	Prof. Claude Wakeland, University of Idaho, Moscow
Illinois	Mr. W. P. Flint, State Natural History Survey, Urbana Dr. T. H. Frison, State Natural History Survey, Urbana Dr. C. L. Metcalf, State Natural History Survey, Urbana
Indiana	Prof. J. J. Davis, Purdue University, Lafayette
Iowa	Dr. Carl J. Drake, Iowa State College, Ames Mr. H. E. Jaques, Iowa Wesleyan College, Mt. Pleasant
Kansas	Prof. G. A. Dean, State Agricultural College, Manhattan Dr. H. B. Hungerford, University of Kansas, Lawrence Prof. H. R. Bryson, State Agricultural College, Manhattan
Kentucky	Prof. W. A. Price, University of Kentucky, Lexington
Louisiana	Dr. W. E. Hinds, State University, Baton Rouge Dr. H. L. Dozier, 1019 Joseph St., New Orleans
Maine	Dr. H. B. Peirson, State of Maine Forest Service, Augusta
Maryland	Dr. E. N. Cory, University of Maryland, College Park
Massachusetts	Mr. A. I. Bourne, Agricultural Experiment Station, Amherst
Michigan	Prof. R. H. Pettit, State College of Agriculture, East Lansing Mr. Ray Hutson, State College of Agriculture, East Lansing
Minnesota	Prof. A. G. Ruggles, University of Minnesota, University Farm, St. Paul
Mississippi	Mr. Clay Lyle, State Plant Board, State College
Missouri	Dr. L. Haseman, University of Missouri, Columbia
Montana	Dr. A. L. Strand, State College, Bozeman
Nebraska	Prof. M. H. Swenk, University of Nebraska, Lincoln Mr. D. B. Whelan, University of Nebraska, Lincoln Mr. L. M. Gates, Department of Agriculture, Lincoln
Nevada	Mr. G. G. Schweis, P. O. Box 1027, Reno
New Hampshire	Mr. L. C. Glover, Agricultural Experiment Station, Durham

New Jersey	Dr. T. J. Headlee, University of New Jersey, New Brunswick Mr. H. B. Weiss, Chief, Bureau of Statistics and Inspection, Department of Agriculture, Trenton
New Mexico	Dr. J. R. Eyer, College of Agriculture, State College
New York	Prof. C. R. Crosby, Cornell University, Ithaca Mr. P. J. Parrott, Agricultural Experiment Station, Geneva Dr. R. D. Glasgow, New York State Museum, Albany Mr. P. J. Chapman, Box 51, Vassar College, Poughkeepsie Prof. A. H. MacAndrews, Department of Forest Entomology, State College, Syracuse Mr. R. E. Horsey, Highland Park, Rochester
North Carolina	Dr. Z. P. Metcalf, State College, State College Station, Raleigh Dr. R. W. Leiby, Department of Agriculture, Raleigh
North Dakota	Prof. J. A. Munro, North Dakota Agricultural College, State College Station, Fargo
Ohio	Prof. T. H. Parks, Ohio State University, Columbus Mr. J. S. Houser, Agricultural Experiment Station, Wooster Dr. H. Osborn, Ohio State University, Columbus Mr. E. W. Mendenhall, Ohio State Department of Agriculture, 97 Brighton Road, Columbus Mr. J. N. Knull, Ohio State University, Columbus
Oklahoma	Dr. F. A. Fenton, Oklahoma Agricultural and Mechanical College, Stillwater Mr. C. F. Stiles, Extension Entomologist, Oklahoma Agricultural and Mechanical College, Stillwater
Oregon	Dr. D. C. Mote, State Agricultural College, Corvallis
Pennsylvania	Dr. T. L. Guyton, Bureau of Plant Industry, Harrisburg Prof. H. E. Hodgkiss, Pennsylvania State College, State College Mr. A. B. Champlain, Bureau of Plant Industry, Harrisburg Mr. H. B. Kirk, Bureau of Plant Industry, Harrisburg Mr. J. R. Stear, c/o Koppers Experiment Farm, Ligonier Mr. C. A. Thomas, Pennsylvania State College, Kennett Square Mr. H. N. Worthley, Pennsylvania State College, State College
Rhode Island	Dr. A. E. Stene, State Department of Agriculture, Kingston
South Carolina	Prof. Franklin Sherman, Clemson College
South Dakota	Prof. H. C. Severin, State College of Agriculture and Mechanic Arts, Brookings
Tennessee	Prof. G. M. Bentley, University of Tennessee, Knoxville



Texas	Dr. F. L. Thomas, Agricultural Experiment Station, College Station
Utah	Prof. G. F. Knowlton, Agricultural Experiment Station, Logan Prof. C. J. Sorenson, Agricultural Experiment Station, Logan
Vermont	Mr. H. L. Bailey, State Department of Agriculture, Montpelier
Virginia	Dr. W. J. Schoene, Virginia Agricultural Experiment Station, Blacksburg Dr. H. G. Walker, Virginia Truck Experiment Station, Norfolk Mr. C. R. Willey, Division of Plant Industry, 1112 State Office Building, Richmond
Washington	Mr. M. H. Hatch, University of Washington, Seattle Prof. R. L. Webster, State College of Washington, Pullman
West Virginia	Dr. L. M. Peairs, West Virginia University, Morgantown Prof. W. E. Rumsey, Agricultural Experiment Station, Morgantown
Wisconsin	Mr. E. L. Chambers, State Department of Agriculture, Madison Dr. C. L. Fluke, University of Wisconsin, Madison
Wyoming	Mr. C. L. Corkins, Office of State Entomologist, Powell
Puerto Rico	Mr. G. N. Wolcott, Insular Experiment Station, Rio Piedras
Hawaii	Mr. O. H. Swezey, Hawaiian Sugar Planters' Association, Honolulu
Mexico	Dr. Alfonso Dampf, Avenida Insurgentes 171, San Jacinto, Mexico, D. F.
Costa Rica	Dr. C. H. Ballou, Apartado 1368, San Jose
Brazil	Mr. E. J. Hambleton, Instituto Biologico de Defesa Agricola, Sao Paulo
Egypt	Mr. A. H. Rosenfeld, Botanical and Plant Breeding Section, Ministry of Agriculture, El Giza

## THE MORE IMPORTANT RECORDS FOR JANUARY AND FEBRUARY 1935

We have inaugurated a new feature in the Bulletin by issuing more detailed survey papers as supplementary numbers to the current numbers. These can be published at any time during the year and will appear as supplements to the last published number. We invite our reporters to avail themselves of this opportunity of publishing results of detailed surveys which would not otherwise be placed on permanent record.

This year the Survey is making a particular effort to round out its information on the biological distribution of the several species of the genus Phyllophaga, and will appreciate any assistance its reporters can give in sending in beetles, with definite records as to locality and date of collection.

In the early summer of 1935 Brood IX of the periodical cicada is scheduled to appear in the eastern Appalachian region, the center of the Brood being in western Virginia and southern West Virginia. The 13-year race this year is represented by Brood XXI which should appear in the South Atlantic and Gulf States, principally in northwestern Florida, western Alabama, and eastern Mississippi. More detailed information will be given in a supplement to the Survey Bulletin which will appear later in the season.

The army cutworm was quite prevalent during late December and February in Nebraska and Kansas.

Late winter observations indicate that the chinch bug suffered but little winter mortality in Kansas, about 10 percent mortality in Indiana, and a similar percentage of mortality in Illinois. This mortality, however, is not sufficient at any point materially to interfere with the forecast of heavy populations given by the fall surveys.

The green bug was observed early in February in considerable numbers in the State of Coahuila in Mexico.

The pea aphid was extremely scarce on vetch during January in the Willamette Valley of Oregon, the populations being very decidedly lower than they were in the early part of 1934.

The sugarcane borer suffered very heavy mortality as the result of the severe freeze which occurred during the third week in January in Louisiana. Examinations made during the third week in February indicated that the mortality averaged approximately 90 percent of the overwintering larvae. A similar heavy mortality following very severe freezing is reported from the Beaumont area in Texas, where the mortality reached from 80 to 96 percent as compared with a mortality of 14 percent in the winter of 1933-34.

The San Jose scale was apparently not severely injured by the winter conditions in Illinois. This insect was reported as very abundant in the Gulf region.

The California red scale was found at Phoenix, Ariz.



The severe frost of December so interfered with new growth on citrus in Florida that the citrus aphid was reduced practically to negligible numbers.

The vegetable weevil was considerably less prevalent in Mississippi than it has been for several years.

The tomato pinworm was observed during the third week in February attacking tomatoes at San Juan Capistrano, Calif.

Rather severe damage to garden peas by the seed corn maggot was reported in Charleston, S. C.

Overwintering forms of the diamond-back moth are about 90 percent parasitized by Angitia hellulae Vier. in the Norfolk area of Virginia.

The strawberry root aphid was very prevalent late in February in Virginia and Louisiana, and red spiders were very prevalent on strawberry in Virginia and Mississippi.

Emergence of canker worms began during the first week in January. Both species are very prevalent.

Two additional infestations of the gypsy moth have been located in Pennsylvania, one in Bear Creek Township, Luzerne County, and the other in Tobyhanna Township, Monroe County.

During early December light infestations of the beech scale were found at six places near Scarsdale, N. Y., this being the first time that the beech scale has been reported from New York.

The infestation of dried fruit at storage plants in the Sacramento Valley last fall by the fig moth was said to have been the heaviest ever experienced in this region.

## GENERAL FEEDERS

### GRASSHOPPERS (Acrididae)

Virginia. H. G. Walker (February 25): Young grasshopper nymphs were active in the field on the Eastern Shore, February 20-22.

Louisiana. W. E. Hinds (February 25): A few grasshopper eggs have hatched.

### MORMON CRICKET (Anabrus simplex Hald.)

Montana. A. L. Strand (February 22): Plans are being perfected for controlling Mormon crickets in eight counties in western Montana. With the exception of Carbon County, the infested area is not expected to be very large in any of the counties.

### ARMY CUTWORM (Chorizagrotis auxiliaris Grote)

Nebraska. M. H. Swenk (February 19): The army cutworm was reported as quite prevalent during the first week in February in yards in Hayes County.

Kansas. H. R. Bryson (February 23): Army cutworms are being found in the vicinity of Manhattan in the usual abundance.

### WIREWORMS (Elateridae)

Washington. H. P. Lanchester (February 21): No winter mortality of larvae and adults of the sugar beet wireworm (Pheletes californicus Mann.) is apparent in Lowden. An investigation on one farm shows a heavy survival of larvae from last year's brood. This will maintain the infestation which averages 1,100,000 per acre. An attempt to obtain a stand of alfalfa has proved an absolute failure owing to heavy larval feeding weakening the young plants. No encouragement can be offered the farmer for future reductions of injury without chemical treatment of the soil. As usual, no winter mortality has resulted to either adults or larvae of the Pacific coast wireworm (P. canus Lec.) in the Walla Walla area. An average of 350,000 wireworms per acre has been estimated. This population prevents the growing of many spring-planted crops and virtually limits the area to asparagus, rhubarb, tomatoes, and crops planted in midsummer or late in the fall. Present indications are for the usual heavy injury to all plants which are in a susceptible stage.

### CRANE FLIES (Tipulidae)

Louisiana. W. E. Hinds (February 25): Crane fly adults have been flying in quite large numbers during the past two weeks.



SAY'S PLANT BUG (Chlorochroa sayi Stahl)

Montana. A. L. Strand (February 22): This species was found in very great numbers in north-central Montana during January and February. So far a great percentage of the hibernating adults are coming through the winter successfully. A considerable proportion of those brought into the laboratory, however, are parasitized by dipterous larvae.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (February 13): Chinch bugs hibernating in seven different kinds of bunchy or tufted grasses taken near La Fayette on January 7 showed 2 percent mortality of 1,384 individuals. On February 1 samples from the same grasses showed 10 percent mortality of 253 bugs. No significant difference in mortality in different kinds of grasses was apparent on either date.

Illinois. W. P. Flint (February 20): Recent counts show a higher winter mortality of chinch bugs than usual. Apparently numbers of bugs died after going into winter quarters, possibly from infection of the white fungus disease. The prevailing temperature conditions would not be expected to kill any numbers of bugs.

Iowa. H. E. Jaques (February 18): Chinch bugs are reported in great abundance from many localities.

Kansas. H. R. Bryson (February 23): Examinations of bunch grass at Manhattan indicate about the usual abundance of chinch bugs. No marked mortality has occurred during the winter.

GREEN BUG (Toxoptera graminum Rond.)

Mexico. C. S. Rude (February 5): Examination in wheat fields near Chavez, Coahuila, showed the presence of the green bug in considerable numbers. Several species of ladybeetles were also present and seemed to be holding the green bug more or less in check. In February and March of 1934 the green bug did considerable damage to the wheat in this area.

CORN

CORN LEAF APHID (Aphis maidis Fitch)

Louisiana. J. W. Ingram (February 20): This aphid was found on Paspalum urvillei until the low temperatures of January 20-22. It was found in fairly large numbers feeding on an undetermined grass at Cut Off on February 8.

VETCH

PEA APHID (Illinoia pisi Kalt.)

Kansas. H. R. Bryson (February 23): Unable to find pea aphids in alfalfa fields to date.

Oregon. L. P. Rockwood and T. R. Chamberlin (February 9): Early fall-sown vetch near Farmington averaged less than one aphid per 100 sweeps on January 29. In 1934, near the same date and in the same section, vetch averaged more than 50 per 100 sweeps. Tall volunteer vetch averaged from 12 to 16 per 100 sweeps, whereas comparable vetch in 1934 averaged 200 per 100 sweeps. Very few fields of vetch in Washington County were seeded early enough in the fall of 1934 to become infested by viviparous forms, whereas there were many infested early fall-sown fields in 1933. On alfalfa and Scotch broom we have been unable as yet to find any aphids. In other years hatching from eggs on these hosts had taken place by this time. Several hibernation caches of coccinellid beetles, Hippodamia sinuata souria Lec., H. quinquesignata obliqua Csy., and H. convergens Guer. have been observed. These predacious beetles are more abundant in these caches than in any year since the winter of 1930-31; they were very scarce in the spring of 1934. The indications are that there will be little aphid damage to vetch in 1935.

GARDEN SLUG (Agriolimax agrestis L.)

Oregon. L. P. Rockwood (February 9): Considerable damage to hairy vetch by the garden slug has been reported in the Willamette Valley. A few damaged fields have been seen. The damage appeared to have been done by the feeding of slugs on the young vetch seedlings. In many cases these seedlings had been entirely consumed. Vetch seedlings were eaten first, then weed seedlings; oats were eaten but little. The damage was most extensive in fields where the vetch had been disked in; vetch on plowed land was damaged but little.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis Fab.)

Louisiana. W. E. Hinds (February 25): Larvae in hibernation in cornstalks show a decided increase in mortality following the second severe cold spell of the winter. The first severe cold snap occurred about December 12, with minimum temperatures of from 10° to 22° F. at Baton Rouge and vicinity. On January 22 the minimum fell to from 17° to 19°. We found only 15 percent of the larvae dead in old cornstalks, between January 15-22. From February 15-22, we found the mortality averaging around 90 percent. This indicates an increase of about 75 percent in mortality, which may be attributed to the drop to 17° to 19°.



Texas. A. I. Balzer (February 8): Examinations of corn and Egyptian wheat in southeastern Texas to this date show a winter mortality in borers of from 80 to 96 percent as compared with a mortality of 14.3 percent in the winter of 1933-34. The minimum temperature at Beaumont this winter was 17° F., while in 1933-34 it was 24°.

#### SUGARCANE BEETLE (Eutheola rugiceps Lec.)

Louisiana. W. E. Hinds (February 25): Injury on the rootstalks of cane, by the fall feeding of adults, is commonly found at this time. The beetles have not yet started their spring activity.

#### SUGARCANE ROOTSTOCK WEEVIL (Anacentrinus subnudus Buchanan)

Louisiana. J. W. Ingram, E. K. Bynum, and W. E. Halev (February 16): Larvae and pupae were found in small numbers in seed cane and cane stubble banked for spring plantings. Heavy infestations have been found in cane stubble in some fields.

W. E. Hinds (February 25): Sugarcane rootstalk weevils, Anacentrinus spp., were present in abundance and in all stages before and after the January freeze.

#### RUSTY PLUM APHID (Hysteroneura setariae Thos.)

Louisiana. J. W. Ingram (February 20): The brown sugarcane aphid (H. setariae) has been found feeding on Andropogon sp. throughout the winter in spite of the unusually cold weather.

#### GRAY SUGARCANE MEALYBUG (Pseudococcus bonensis Kuw.)

Mississippi. C. Lyle (February 23): A light infestation on sugarcane was found at Meridian in November. It is now believed that the infestation has been practically eradicated.

### FRUIT INSECTS

#### APPLE

#### FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Illinois. W. P. Flint (February 20): Many reports are being received of damage in orchards. Much of the damage was not noticed until the trees were pruned during the winter. There have also been numerous reports of injury to shade trees.

#### WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

Mississippi. D. W. Grimes (February 22): The woolly apple aphid is moderately abundant on apple at Sallis.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Illinois. W. P. Flint (February 20): The San Jose scale survived the winter in more than normal numbers. To date only a very small percentage of the scale has been killed.

Alabama. J. M. Robinson (February 14): The San Jose scale is moderately abundant on fruit trees.

Mississippi. C. Lyle (February 23): State Plant Board inspectors and correspondents located in all sections of the State report medium to severe infestations on unsprayed peach, apple, and plum trees.

PEACH

PEACH BORER (Aegeria exitiosa Say)

Mississippi. C. Lyle (February 23): During the fall and winter many complaints regarding injury to peach trees were received from correspondents in various sections of the State. Inspector L. J. Goodgame at Aberdeen states that the borer can be found in almost any untreated tree and that he has taken infested nursery stock from shipments of one-year-old trees. A correspondent at Magnolia, Pike County, sent us specimens which had been taken from cherry-laurel plants.

D. W. Grimes (February 22): The peach borer is moderately abundant on peach at Durant.

BLUEBERRY

ROOT WEEVILS (Brachyrhinus spp.)

Washington. W. W. Baker and J. Wilcox (December 1934): An appeal for aid was received from a blueberry grower near Bellevue. When his field was visited in November, the berries were found to be heavily infested with B. ovatus L. and B. sulcatus Fab.

BLACKBERRY

A BERRY MITE (Eriophyes essigi Hassan)

Washington. J. Wilcox and W. W. Baker (December 1934): A survey was conducted during October and November. New infestations were found on wild and cultivated blackberries in Whatcom County southward to Pierce and Thurston Counties.

CITRUS

FRUIT FLIES (Anastrepha spp.)

Texas. M. H. Ford (January): A total of 142 adults of A. ludens Loew were trapped on 86 premises in the lower Rio Grande Valley during



January. This indicates a considerably larger population than during December 1934. In addition 18 A. serpentina Wied., 102 A. fraterculus auct. not Wied., 318 A. pallens Coq., 3 A. striata Schin., and 31 Toxotrypana curvicauda Gerst. were trapped. One hundred and sixty undetermined fruit flies were also collected.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. B. L. Bowden (January 21): "I saw the State Entomologist in Phoenix and he told me that a scouting inspection of ornamentals there disclosed several plants (euonymus and rose were mentioned) infested with red scale. The infested plants are being dug out and destroyed and the surrounding plants sprayed. He was of the opinion that the scale was brought in on nursery stock from California. It has not spread to the citrus plantings."

PURPLE SCALE (Lepidosaphes beckii Newm.)

Mississippi. H. Gladney (February 21): Heavy infestations have been reported in some citrus groves in Harrison County. The weakened condition caused by these insects and the low temperature in January killed a great many trees.

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (February 27): Owing to the cold weather of December and the continued drought, there has been very little new growth on citrus this past winter, and the citrus aphid has been almost starved out. A few are appearing since the new growth has started on citrus, but it does not seem probable that there will be a heavy infestation.

CITRUS WHITEFLY (Dialeurodes citri Riley and How.)

Mississippi. D. W. Grimes (February 22): The whitefly is moderately abundant on citrus at Bentonia.

Louisiana. W. E. Hinds (February 25): White flies on citrus and on some privets appear to have received a setback by the freeze, which resulted in the shedding of foliage on many of these host trees. However, the cold did not defoliate nearly all host plants and a normal infestation may develop later in the season.

A TERMITE (Kalotermes simplicicornis Emk.)

Texas. S. E. Jones (December 1934): This termite was found causing injury to satsuma orange trees at Winterhaven during December.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

California. H. J. Ryan (February 27): The rust mite, P. oleivorus, is showing up in a slight infestation on citrus in the North Whittier

Heights district: This is the time of year that infestations build up rapidly.

SPIDER MITES (Tetranychus spp.)

Florida. J. R. Watson (February 27): The six-spotted mite and the purple mite are at the present time rather common on citrus in the southern part of the State.

Mississippi. H. Gladney (February 21): Some citrus groves at Ocean Springs are rather heavily infested by T. telarius L. The trees were partly or completely defoliated by the cold weather of January and the spiders are clustered on the branches.

AVOCADO

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Florida. J. R. Watson (February 27): Shot-hole borers are damaging avocado and other trees which were injured by the freeze of December. In many instances they will probably kill seriously injured trees.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Gyll.)

Alabama. J. M. Robinson (February 14): The vegetable weevil has been active in the southern half of the State since November.

Mississippi. C. Lyle (February 23): Inspector M. L. Grimes reports that he observed injury to carrots and turnips at Meridian recently. However, the injury was light and the weevils have been less abundant in that locality during the winter than for several years.

D. W. Grimes (February 23): Injury is severe on turnips and slight on onions at Sallis, Carthage, Bentonla, and West.

H. Gladney (February 21): Observed doing from medium to serious damage to turnips in Jackson County during January and February.

J. P. Kislanko (February 21): The vegetable weevil caused severe injury to turnip patches during December and January in the vicinity of Purvis and other places in Lamar County.

Louisiana. W. E. Hinds (February 25): Vegetable weevils have been active and abundant for weeks and do not appear to have been set back at all by the cold.



CUCUMBER BEETLES (Diabrotica spp.)

Virginia. H. G. Walker (February 25): Twelve-spotted cucumber beetles (D. duodecimpunctata Fab.) were observed feeding in kale fields at Norfolk on warm days in December, January, and February.

Florida. J. R. Watson (February 27): D. balteata Lec. has been taken at Monticello, where it was severely injuring Chinese cabbage.

Alabama. J. M. Robinson (February 14): The banded bean beetle (D. balteata) developed in large numbers during the fall of 1934, but has been less numerous since the freezing weather.

Mississippi. H. Gladney (February 21): Adults of D. 12-punctata are somewhat plentiful and are doing some damage to vegetables in Harrison County.

J. P. Kislanko (February 21): Twelve-spotted and banded cucumber beetles were observed to be quite common during the winter months, causing some trouble to truck-crop growers in Stone County.

Louisiana. W. E. Hinds (February 25): D. vittata Fab. adults are active in small numbers. D. 12-punctata adults are probably less abundant than usual at this time of year. No D. balteata has been seen yet.

Texas. J. N. Roney (January): D. 12-punctata and D. balteata were found feeding on turnips, mustard, cabbage, and beets during December 1934 and January 1935 at Dickinson.

APHIDS (Aphididae)

Virginia. H. G. Walker (February 25): The turnip aphid (Rhopalosiphum pseudobrassicae Davis) and the spinach aphid (Myzus persicae Sulz.) are very scarce at present at Norfolk.

Louisiana. W. E. Hinds (February 25): R. pseudobrassicae is very abundant on turnip.

TOMATO

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. J. C. Elmore (February): On February 18 moths were observed flying up from dead tomato plants at San Juan Capistrano. Larvae were present but scarce on small tomato plants in an outdoor seed bed. Larvae believed to be of this species were found mining and folding the leaves of Solanum umbelliferum at Laguna Beach on February 19.

A PENTATOMID (Arvelius albopunctatus DeG.)

Texas. S. E. Jones (November 1934): This pentatomid was found feeding on tomatoes at Winterhaven in November. The injury consisted of punctures

in the tomato fruit, causing it to develop a disagreeable flavor. The adults are somewhat gregarious; a relatively light infestation may destroy a crop.

### BEANS

#### MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

Maine. N. F. Howard (February 28): In a letter dated October 27, 1934, J. H. Hawkins gives Milo, Piscataquis County, as a record of the spread of the Mexican bean beetle.

Ohio. N. F. Howard (February 21): The results of examining beetles in hibernation at Columbus indicate that the survival will be very much lower than during the preceding two years and it may approach the low point reached several years ago.

New Mexico. R. L. Wallis (February 29): At present the survival of the Mexican bean beetle in the Estancia Valley is higher than for the past two years. Examination of beetles in hibernation cages February 18 shows 55.17 percent of the beetles still alive. Counts showed 26.08 percent at the same time in 1934, 24.08 percent in 1933, and 78.59 percent in 1932.

### PEAS

#### PEA APHID (Illinoia nisi Kalt.)

California. R. E. Campbell (February 21): All pea districts from Imperial to Salinas show some infestation, but in only a few fields is it heavy enough to cause damage.

#### SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

South Carolina. C. O. Bare (January 8): The seed corn maggot was found doing considerable damage to garden peas at the Charleston Truck Experiment Station. The peas had been planted at a rather shallow depth in land containing decaying organic matter. In an approximately average situation in the field, a count showed 30 of 150 young plants, or 53 percent, destroyed by maggots in the cotyledons.

### CABBAGE

#### DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker (February 25): Collection of material at Norfolk from several fields of kale and collards which were severely damaged last fall showed that over 90 percent of the overwintering forms are parasitized by Angitia hellelae Vier. (identified by R. A. Cushman). One species of hyperparasite has been reared from the material. Although the larvae of this moth normally pupate on the plant near where they feed, on the leaves and along the midribs, during the cold



weather they were crawling down and pupating in the dead leaves on the ground beneath the plant. Both parasites and moths were flying actively about infested kale fields on February 23.

Texas. S. W. Clark, S. E. Jones, and J. N. Roney (December 1934): The diamond-back moth was injurious to cabbage during December at Weslaco, Winterhaven, and Dickinson.

CABBAGE LOOPER (Autographa brassicae Riley)

Texas. S. W. Clark, S. E. Jones, and J. N. Roney (December 1934): A. brassicae was injurious to cabbage during December at Weslaco, Winterhaven, and Dickinson.

IMPORTED CABBAGE WORM (Ascia rapae L.)

Louisiana. W. E. Hinds (February 25): Cabbage butterflies are scarce but active, and eggs and young larvae are quite easily found. Loopers, Autographa brassicae Riley, and other species are not active yet.

GREENHOUSE LEAF TIER (Polytaenia rubigalis Guen.)

South Carolina. C. O. Bare (December 1934): The greenhouse leaf tier was found feeding on cabbage at Charleston from November 7 to December 10. This was my first observation of this insect feeding on any crop at the Truck Experiment Station. It was most numerous on the undersides of the lower leaves but hardly abundant enough to be of economic importance. From December 6-10, the apparent time of greatest abundance, there was an average of approximately .03 larva per plant. Sometimes several larvae occurred on the same plant. (Det. by C. Heinrich)

CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Walker (February 25): The cabbage aphid is very scarce at Norfolk.

Mississippi. H. Gladney (February 21): Infestations of the cabbage aphid were noted on cabbage and collards in scattered localities in Jackson and Harrison Counties.

Louisiana. W. E. Hinds (February 25): Aphids are abundant on cabbage.

STRAWBERRY

STRAWBERRY ROOT APHID (Aphis forbesi Weed)

Virginia. H. G. Walker (February 25): Eggs, just beginning to hatch, were rather abundant in many of the fields on the Eastern Shore. This pest was also found in some of the strawberry fields in Norfolk and Princess Anne Counties.

Louisiana. W. E. Hinds (February 25): Aphids are reported on the roots of strawberry plants at Baton Rouge. Ants in abundance are attending the aphids.

A LYGAEID (Orthaea bilobata Say)

Texas. S. E. Jones (1934): This species was found in many strawberry fields near Winterhaven during 1934. In some instances it caused severe damage to the fruit.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker (February 25): A survey of strawberry fields on the Eastern Shore on February 20 showed that red spiders were very abundant in some fields, whereas in others they were very scarce or entirely absent. Red spiders were found in some of the strawberry fields in Norfolk and Princess Anne Counties.

Mississippi. C. Lyle (February 23): On February 11 a grower at Bay Saint Louis reported a medium infestation on his strawberry plants.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (February 19): At San Juan Capistrano from 6 to 29 adult weevils per plant were found on occasional pepper plants left standing after a field had been disked. There were immature stages in the green pods. Seventy-one adult weevils were taken from 10 night-shade plants.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius Fab.)

Mississippi. C. Lyle (February 25): A small infestation of the sweetpotato weevil was found in Greene County during the fall; steps were immediately taken to clean it up.

BEETS

HAWAIIAN BEET WEBWORM (Hymenia fascialis Cram.)

Texas. S. W. Clark and J. N. Roney (November 1934): This webworm caused severe injury to beets at Weslaco and Dickinson during November.



## FOREST AND SHADE - TREE INSECTS

### CANKER WORMS (Geometridae)

Kansas. H. R. Bryson (February 23): Alsophila pometaria Harr. and Paleacrita vernata Peck are very abundant. Emergence began the first week in January and large numbers had been caught on the bands by February 5.

### GYPSY MOTH (Porthetria dispar L.)

Vermont. H. L. Bailey (February 28): We have found an unusually heavy gypsy moth infestation in the town of Newbury in Orange County. About 2,500 egg masses were taken in an area about three-fourths of a mile square. There was evidently a very heavy hatch of the caterpillars last spring notwithstanding the extreme cold of the preceding winter. This is outside the area in Vermont which may be considered as generally infested.

Pennsylvania. A. F. Burgess (January 22): Intensive scouting work was done in the vicinity of an assembling cage in Tobyhanna Township in Monroe County where a male moth was taken last summer. As a result, 477 acres of woodland and one-fourth mile of open country along roadsides were examined; and two additional infestations were found, one in Bear Creek Township, Luzerne County, the other in Tobyhanna Township.

### BEECH

#### BEECH SCALE (Cryptococcus fagi Beer.)

New York. M. W. Blackman (January 23): Infestations of the beech scale have been found in Westchester County at Scarsdale, and immediate vicinity. On December 11 and 12, R. C. Brown and C. L. Griswold, of the Melrose Highlands laboratory, made a rough survey, examining beech trees along the principal parkways. Light infestations were found at six places within a radius of 6 miles from Scarsdale. This is the first time the scale has been reported from New York State.

### ELM

#### EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Idaho. C. Wakeland (February 20): The European elm scale, which has become established in Moscow during the last few years, increased very rapidly last year following the mild winter of 1933-34. We have been making examinations recently to determine the effect of cold weather on this insect in this vicinity and find that the average percentage of survival is 0.16. All the living scales are under old scale bodies, pieces of bark, and in other protected places. The lowest temperature was -19° F.

### LARCH

#### LARCH CASE BEARER (Coleophora laricella Hbn.)

New York. R. E. Horsey (February 23): Caterpillars, alive in their cases,

were found today on Larix dahurica at Rochester. Of several species of larch examined last year, this species was the heaviest infested. The trees were thoroughly sprayed at the time, but evidently some of the insects escaped to feed this year when the leaves start to grow. This insect is becoming a serious pest around Rochester.

MAPLE

GLOOMY SCALE (Chrysomphalus tenebricosus Comst.)

West Virginia. F. M. Craig (December 19): The gloomy scale is prevalent on red maple in Charleston. I first noticed it three summers ago when we received many reports that maple trees were dying, apparently from the attack of this scale. All trees visited were soft maples. Last summer I heard no complaint and judging from the season's growth on a few trees I inferred that the winter of 1933-34 killed a great many of the scales. The insect was not eradicated as the twigs sent you indicate. (Det. H. Morrison.)

North Carolina. Z. P. Metcalf (February 15): The gloomy scale seems to be more abundant on maple than for the past several years.

Mississippi. D. W. Grimes (February 22): Gloomy scale is moderately abundant on maple at Bentonla.

OAK

OBSCURE SCALE (Chrysomphalus obscurus Comst.)

Mississippi. C. Lyle (February 23): Medium infestations on oak leaves have been reported during the past several weeks from Kosciusko, Meridian, and Ocean Springs.

PINE

WESTERN PINE BEETLE (Dendroctonus brevicomis Lec.)

California. M. W. Blackman (February 13): J. M. Miller reports that field work on the 1934 survey, to locate areas of bark beetle infestations, was completed by November 15. The more important timber-producing areas in eight national forests extending from central to northeastern California were covered. Aggressive infestations of the western pine beetle prevail throughout northeastern California, being particularly severe in areas where the beetle populations had suffered a setback from the extremely low temperatures of December 1932. The effect of the high mortality, resulting from the freeze, on the course of the infestation was evident only during the season immediately following. Recovery of the beetle populations was evident toward the close of the 1933 season and in 1934 the upward tendency was continued showing marked acceleration in places. One trend exhibited by current infestations is that of extension of aggressive attacks to valuable timber stands that had not suffered severe losses until this year.



PINE NEEDLE MINER (Recurvaria milleri Busck)

California. J. M. Miller (January 2): Surveys conducted during September 1934 have shown that the needle miner greatly increased the extent of the infested areas in the high Tuolumne watersheds in the Yosemite National Park during the flight season of 1933. These new epidemics will undoubtedly extend the areas of dead lodgepole pine forests within the park, and the forest cover on the intensively used camp ground areas around the Tuolumne meadows is now threatened.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

New York. R. E. Horsey (February 25): The live, purplish eggs of the pine needle scale are now to be found under the overwintering scale on mugho pine at Rochester. There is no evidence of winter mortality. This scale is well established at Rochester, and is fairly common on mugho, Austrian, and Scotch pine.

Nebraska. M. H. Swenk (February 19): Reports of spruce trees being attacked by the pine leaf scale were received from Phelps and Sioux Counties on January 10 and February 14, respectively.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

AZALEA

COMMON RED SPIDER (Tetranychus telarius L.)

Louisiana. W. L. Hinds (February 25): Red spiders were very abundant on many plants before the January freeze. Most adults and nymphs appeared to have been killed by the freeze, but eggs were not killed. During the past month eggs have hatched and produced a fairly heavy infestation, especially on azaleas.

BAMBOO

BAMBOO SCALE (Asterolecanium bambusae Bdv.)

Mississippi. C. Lyle (February 23): A medium infestation on bamboo was reported from Biloxi, in Harrison County, on January 2.

DEODAR

DEODAR WEEVIL (Pissodes deodarae Hopk.)

Mississippi. C. Lyle (February 23): Inspector M. L. Grimes reports light to medium injury to Cedrus deodara at Meridian.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

North Carolina. Z. P. Metcalf (February 15): Euonymus scale is reported as especially abundant in the eastern half of the State.

Mississippi. C. Lyle (February 23): Euonymus twigs heavily infested have been received recently from Greenville, in Washington County, and Lambert, in Quitman County.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Florida. J. R. Watson (February 27): The gladiolus thrips is doing serious damage in some plantations in the southern part of the State.

LILAC

OYSTER-SHELL SCALE (Lenidosaphes ulmi L.)

New York. R. E. Horsey (February 25): Live eggs under scales on lilac have been observed at Rochester. I doubt if there will be many eggs killed by cold weather. This scale is quite common on lilac and ash, except where plantings are watched and sprayed.

PRIVET

WHITE PEACH SCALE (Aulacaspiis pentagona Targ.)

Mississippi. C. Lyle (February 23): On January 17 a correspondent at Fayette, in Jefferson County, sent to this office privet twigs showing a heavy infestation.

SUMAC

A PSYLLID (Calophya flavida Schwarz)

New York. R. E. Horsey (February 25): The blackish, scalelike overwintering young are alive and quite common on a number of smooth and shining sumac (Rhus glabra and R. copallina). One- and two-year-old twigs in many instances are well spotted with the black dots; and while the damage is not evident and the shrubs are growing well, these psyllids must be quite a drain on the plants.

VIRGINIA CREEPER

A LEAFHOPPER (Erythroneura comes ziczac Walsh)

Utah. G. F. Knowlton (February 13): This leafhopper is active on warm afternoons at Logan.



INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

Mississippi. C. Lyle (February 23): On February 7 a correspondent at Ruleville sent specimens with a report that he had recently found five of these spiders in his plant bed.

Nebraska. M. H. Swenk (December 20 to February 19): Specimens of the black widow spider were received on January 8 and February 14 from Antelope and Furnas Counties, respectively.

CATTLE

COMMON CATTLE GRUB (Hypoderma lineatum DeVill.)

Mississippi. C. Lyle (February 23): In December a correspondent at Perkinson sent specimens taken from the back of a cow; early in January specimens taken from a mule were sent from Winona.

Kansas. H. R. Bryson (February 26): This cattle grub is abundant in the northwestern corner of the State.

SCREW WORMS (Cochliomyia spp.)

Mississippi. C. Lyle (February 23): Reports of infestations of the screw worm were received from various sections of southern Mississippi at intervals throughout the winter.

A BUFFALO GNAT (Simulium sp.)

Mississippi. D. W. Grimes (February 22): A few buffalo gnats were observed at Hoffman.

LONG-NOSED OX LOUSE (Linognathus vituli L.)

Nebraska. M. H. Swenk (January 15): A Kearney County correspondent reported that his calves were infested with long-nosed cattle lice.

HORSES

BROWN WINTER TICK (Dermacentor nigrolineatus Pack.)

Mississippi. C. Lyle (February 23): A correspondent at Okolona recently sent to this office specimens taken from a horse.

SWINE

HOG MANGE MITE (Sarcoptes scabiei suis DeG.)

Nebraska. M. H. Swenk (January 12): A request for information on pinning hogs for mange was received from Holt County.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

West Virginia. L. M. Pesins (March 2): Winged termites were issuing in houses in Morgantown between February 16 and March 1.

North Carolina. Z. P. Metcalf (February 15): Flights of termites were reported on several days in January and February, indicating that these insects will perhaps be very destructive during the coming season.

Alabama. J. W. Robinson (February 14): Termites are reported damaging buildings in Prattville and Montgomery.

Mississippi. C. Lytle (February 23): During the fall and winter more than 30 complaints regarding termite injury to houses were received from various sections of the State.

Louisiana. L. E. Hinds (February 25): Termites are very abundant in old cornstalks in some localities; winged forms are numerous and ready to swarm. They are infesting buildings and have been swarming at Baton Rouge since about the first week of February. The flights became very common as the weather cleared following a week in which light rains occurred daily.

Nebraska. M. H. Swenk (February): R. tibialis Bks. was reported as severely damaging a grain elevator in Douglas County about the middle of February.

Kansas. H. F. Bryson (February 23): The first termite swarm was observed on February 21 at Manhattan.

ANTS (Formicidae)

Mississippi. W. E. Smith (February 22): Ants collected near Agricola were sent to me with the following report: "The ants build mounds as large as half bushel measures or larger, giving the appearance of a number of bee hives scattered around. These mounds are literally full of ants. The ants were first noticed about 4 or 5 years ago. They are very troublesome at the time cows are calving." This ant is an introduced species of South American fire ant, Solenopsis saevissima var. richteri Forel. and is not known from any other locality in the United



States except Mobile and several towns in that vicinity. The fire ant, S. xyloni MacCook, has been active almost the entire winter except for a very severe cold spell of about a week's duration when the temperature dropped to 10° F. An examination of a large number of nests on a western slope at State College following this freeze showed that the ants suffered a mortality ranging from about 10 to 40 percent of the entire colony. In other locations the colonies showed practically no mortality. A correspondent at Shelby sent to us specimens of Pharaoh's ant (Monomorium pharaonis L.) with the remark that the ants had been very troublesome in his house for about a year. Specimens were also received from Tubelo, Waynesboro, and Blue Mountain with complaints that they were very annoying. New infestations of the Argentine ant (Iridomyrmex humilis Mayr) have been recorded from Noxapater and Hivannee.

Texas. M. R. Smith (February 22): In January ants from George West, in Live Oak County, were sent in with the report that they were injuring cotton. The ants proved to be Pheidole desertorum var. comanche Walr.

#### BOXELDER BUG (Leptocoris trivittatus Say)

Kansas. H. R. Bryson (February 26): Fewer reports of annoyance have been received this year than for many years.

Utah. G. F. Knowlton (February 13): Boxelder bugs are causing annoyance in homes and school buildings in various parts of northern Utah.

#### FIG MOTH (Ephestia figulilella Greg.)

California. H. C. Donohoe (February 11): A survey of storage plants receiving dried fruits from the Sacramento Valley indicates that the infestation in dried fruits from growers last fall was the greatest ever experienced in this district.

#### CHOCOLATE MOTH (Ephestia elutella Hbn.)

California. H. C. Donohoe (February 11): Small numbers of adults were collected in dried fruit storage plants at Oakland, Napa, and Yuba City during the first week in February. The moth was commonly encountered in field and dried fruit storages in the San Joaquin Valley.

#### DRIED FRUIT MOTH (Vitula serratilineella Rag.)

California. H. C. Donohoe (February 11): This insect was found in small numbers in dried fruit storages in San Jose, Oakland, Berkeley, and Napa the first week in February.

#### INDIAN-MEAL MOTH (Plodia interpunctella Hbn.)

California. H. C. Donohoe (February 11): Infestation ranged from slight to heavy in stored prunes in San Jose the first week in February.

Throughout the San Francisco Bay and Sacramento Valley areas all dried fruit storage plants visited were infested.

A PYRALID (Anhomia gularis Zell.)

California. H. C. Donohoe (February 11): Damage to stored prunes from Santa Clara Valley, stored in Oakland and San Jose, ranged in late fall from slight to severe. The moth was found in small numbers in the storage houses the first week in February.

RICE WEEVIL (Sitophilus oryzae L.)

Louisiana. W. E. Hinds (February 25): Black weevils are less common than usual in old cornstalks in the fields. However, the cold was not sufficiently severe to check their breeding and survival in corncribs and rice warehouses where they are normally abundant.

CIGARETTE BEETLE (Lasioderma serricorne Fab.)

Nebraska. M. H. Swenk (January 2): Specimens of the cigarette beetle were sent in from Merrick County, where they had been taken from the upholstering of a parlor suite.

PEA WEEVIL (Bruchus pisorum L.)

Idaho. C. Wakeland (February 20): T. A. Brindley, who is stationed at Moscow working on the pea weevil, had many cages containing living weevils exposed in various situations. He finds that mortality of weevils was almost complete in cages, but that there is a heavy percentage of survival beneath the bark of ponderosa pine trees.





# INSECT PEST SURVEY BULLETIN

Vol. 15

April 1, 1935

No. 2

## THE MORE IMPORTANT RECORDS FOR MARCH 1935

Reports of the usual damage by cutworms were received during the last 2 weeks of March from Kansas, Missouri, and Tennessee, southward to the Gulf and the Mexican border.

White grub beetles started heavy flights in the Gulf States during the third week of the month.

Heavy infestations of several species of wireworms were reported from the Pacific Coast States.

The chinch bug came through the winter successfully throughout the chinch bug belt.

Heavy infestations of the green bug were reported from South Carolina during the first half of the month.

Eastern tent caterpillars are hatching from Kansas to Tennessee. The insect will probably be unusually abundant throughout the Eastern States this year, as large numbers of eggs have been reported over this area.

The San Jose scale is reported as generally prevalent from New York westward to Wisconsin and southward to the Gulf. This insect appears to be on an upward trend.

Flat-headed apple tree borers were doing unusual damage from Ohio to Nebraska.

Adult plum curculios were generally distributed over the peach orchards of the Fort Valley section of Georgia by the third week of the month, with a heavier infestation than usual.

A rapid increase in abundance of the citrus aphid in Florida was reported during the last week of March.

Tomato pinworms are reported in large numbers in tomato fields in the Santa Ana and San Juan Capistrano districts of California.

The pea aphid was seriously damaging market peas in Santa Barbara and San Luis Obispo Counties, California.

Very severe damage by the onion thrips to celery was reported from



Sarasota County, Fla. Heavy infestations of onions by this thrips were reported from southern Louisiana.

The winter has, in general, been favorable for the survival of beet leafhoppers in southern Idaho and southwestern Utah. About normal populations entered hibernation last fall.

Canker worms were generally abundant in Connecticut, New Jersey, Illinois, Missouri, Kansas, and Colorado.

An outbreak of buffalo gnats occurred in parts of the delta counties of Arkansas and Mississippi.

## GENERAL FEEDERS

### GRASSHOPPERS (Acrididae)

Tennessee. G. M. Bentley (March): Grasshoppers, Schistocerca americana Drury and Dissosteira carolina L., are moderately abundant in eastern Tennessee.

California. S. Lockwood (March 25): The eggs of Melanoplus mexicanus Sauss. were just beginning to hatch in Imperial County on March 19. A few nymphs of Gamula pellucida Scudd. were found in grazing land south of San Diego County close to the coast. In the hills above the Santa Maria Valley, in San Luis Obispo County, a few first-instar nymphs of C. pellucida were found and many of the eggs in the egg beds were on the verge of hatching. On March 24 these eggs started hatching, immediately after they were removed from the soil and warmed by the sun.

### EUROPEAN EARWIG (Forficula auricularia L.)

Oregon. D. C. Mote (March 21): Males are beginning to move around. We have had reports of their being found in homes at Corvallis.

### CUTWORMS (Noctuidae)

Tennessee. J. U. Gilmore (March 22): Folia renigera Steph. and Feltia ducens Walk. are seriously injuring early gardens at Clarksville.

Mississippi. C. Lyle (March 22): Inspector Jack Milton, of Jackson, states that he has observed some injury to tomato plants in cold frames by cutworms during the past week.

Louisiana. W. E. Hinds (March 26): Various species of cutworms are attacking young garden plants at Baton Rouge.

Missouri. L. Haseman (March 26): At Columbia, from half-grown to nearly full-grown specimens of what is apparently the variegated cutworm (Lyceophotia margaritosa saucia Hbn.) have been taken since early in March. The county agent of McDonald County has just reported severe injury on the edge of a wheat field next to a wood by what was probably greasy cutworms (Agrotis ipsilon Hott.).

Arkansas. D. Isely (March 22): Cutworms (Lyceophotia sp.) are unusually abundant in northwestern Arkansas.

Kansas. H. E. Bryson (March 25): From February 25 to March 4 the variegated cutworm (L. margaritosa saucia) was reported by E. G. Kelly as very abundant in Edwards, Finney, Hodgeman, Ford, Gray, Clark, Comanche, and Pratt Counties. The worms were doing serious injury to fall-sown wheat, barley, and rye at the edges of the fields where they moved in from grass and stubble lands.

Kansas, Nebraska, and Oklahoma. R. T. Cottrell (March 25): The army cutworm (Spodoptera auxiliaris Grote) is abundant and causing damage in local areas in Kansas, in Riley, Ellsworth, Edwards, Kiowa, Pratt, and Comanche Counties. The species is plentiful in Cloud, Dickinson, Osborne, Ottawa, Barber, Rice, and Ford Counties, but no damage was seen or reported. Eighteen additional counties reported the species to be scarce or absent. In Nebraska all reports indicated the species to be scarce. In Oklahoma 9 acres of wheat in Blaine County have been destroyed, but no other injury was reported. Alfalfa County reported the insect as plentiful, but no damage was seen or reported.

Utah. G. F. Knowlton. (March 14): Cutworms are unusually abundant on the range 8 miles northwest of Corinne.

Arizona. C. D. Lebert (March 21): Slight damage to grape buds in an 80-acre vineyard near Phoenix by a climbing cutworm was noted.

California. S. Lockwood (March 27): On March 26 an inspection was made of a citrus grove in Tulare County in the Ivanhoe district. A cutworm, Parastichtis purpurea Grote, was found to be feeding very freely on chickweed between the trees and many of them had climbed into the interlocking branches of the citrus and were eating the young fruit buds and foliage. The infested area was not definitely ascertained.

#### WHITE GRUBS (Phyllophaga sop.)

Louisiana. W. E. Hinds (March 26): Phyllophaga (especially P. congrua Lec. and P. futilis Lec.) and a few Dyscinetus trachypygus Burm. were flying abundantly at Baton Rouge on the evening of March 21, when air temperature was about 70° F. and the relative humidity from 80 to 90 percent.

Mississippi. C. Lyle (March 22): May beetles were present in large numbers at lights at State College on March 21 for the first time this year. A few specimens were determined by J. M. Langston as P. calceata Lec.

Kansas. H. P. Bryson (March 25): Holes dug on March 23 to determine the abundance of white grubs indicate the presence of fewer grubs and May beetles than usual per unit area in native prairie sod. We have taken no beetles at lights. They are very close to the surface of the soil; so we should procure some this week.

#### GREEN JUNE BEETLE (Cotinis nitida L.)

Illinois. C. L. Metcalf (March 27): We have a report of the green June beetle from West Frankfort, with the information that thousands of larvae are present in gardens and lawns.

Tennessee. J. U. Gilmore (March 22): White grubs, C. nitida, are now becoming active and are attacking lettuce, radish, and onion at Clarksville. Grubs are also active in tobacco plant beds, although the



plants have not yet appeared.

### WIREWORMS (Elateridae)

South Carolina. W. Dietrich (June 1934): A specimen of Heteroderes laurentii Guer. was collected at Myrtle Beach in June 1934 by C. H. Townes.

Washington. M. C. Lane and H. P. Lancaster (March 20): Commercial gladioli growers of the Sunnyside area are planning treatment of the soil to control the wireworms Pheletes canus Lec. and P. californicus Mann. in the fields which are to be planted to this crop. The general upward movement of these wireworms through the soil at Walla Walla has been somewhat checked by cool weather. Market growers report the presence of a few wireworms in the surface soil.

California. R. E. Campbell (November 1934): At Temple City an early rainfall of over 2 inches in October, followed by warm weather, was evidently favorable to the wireworm P. californicus, as it has done considerable damage to rutabagas. From a crop of 7,000 sacks (100 pounds), 750 sacks were thrown out as culls, owing to holes eaten in them.

A. E. Michelbacher (March 21): Near Sacramento several acres of a sugar beet field were noticed to be heavily infested by wireworms on March 19. Considerable damage was being done.

M. W. Stone (February): Cardiophorus tenosus Lec. was first taken on alfalfa in Orange County on February 1. A few have been taken under piles of melba since then. Population counts were again resumed in the 5-acre lima bean field in Orange County on February 24. This is the fourth year trapping has been carried on in this field, 10,521 beetles having been captured to date. In 1933, 2,913 were captured, and 4,111 in 1932.

### SAY'S STINK BUG (Chlorocoryza savi Stahl)

Montana. A. L. Strand (March 19): A brief survey of north-central Montana has been completed and this plant bug is coming through the winter in enormous numbers. The center of the infestation is in western Hill, Liberty, and Chouteau Counties, but extends as far east as Blaine County and as far south as Cascade, and occurs in considerable numbers in eastern Pondera, Teton, and Toole Counties.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT AND OTHER SMALL GRAINS

#### HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (March 23): No serious infestation is expected this summer. Some early sown fields in northern Ohio have a medium infestation,

whereas the later sown fields are free from the insect. Wheat looks very well, with less than the usual amount of winter injury.

#### CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (March 15): The mortality of chinch bugs in samples of 3 species of bunchgrass taken from the field on March 11 was 13 percent of a total of 1,621 bugs. No significant difference in mortality was apparent in the different kinds of grass. The bugs were stirring about in the grass clumps on March 4 and 15, when maximum temperatures were 6° and 73° F., respectively, some even crawling an inch or so up the stems, but none were leaving their hibernation quarters.

Illinois. W. F. Flint (March 20): Recent counts have shown winter mortality in hibernating chinch bugs to be approximately 14 percent. This is not sufficient to make any appreciable decrease in the probable damage this spring. There has been no flight of the bugs as yet, and very little activity in winter quarters.

Missouri. L. Maseman (March 26): From about 10 to 15 percent of the hibernating chinch bugs in central Missouri have died but a heavy population is present in about 90 counties.

#### GREEN BUG (Toxoptera graminum Rond.)

South Carolina. C. F. Rainwater (March 15): Aphids were collected from the leaves of oats in Florence County, where they are generally distributed over the entire county and are causing alarm among the farmers. Some entire fields have been killed, and spots in many other fields have been either killed or severely stunted. Rye is being attacked to about the same extent as oats. Some of the aphids are parasitized, but the percentage of parasitization is rather low. (Det. by F. W. Mason)

#### APPLE GRAIN APHID (Rhopalosiphum prunifoliae Fitch)

California. E. C. Essig (March 25): The apple grain aphid was very abundant on grains and grasses from February 25 to March 25 at Berkeley.

#### CORN

#### EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. N. Turner (March 23): About 30 percent winter mortality in heavily infested weed areas in Hartford County. A comparatively large infestation remains.

#### WEBWORMS (Crambus spp.)

Tennessee. G. M. Bentley (March): Sod webworms are general throughout the State.

ALFALFA

ALFALFA WEEVIL (Eurys postica Gyll.)

California. A. E. Michelbacher (March 21): About Niles the alfalfa weevil was active throughout the entire winter. At present, counts in excess of 100 larvae per 100 sweeps of an insect net have been obtained. In one heavily infested field on February 19, 7 stems out of 200 examined were found to contain eggs, as compared with 14 out of 300 stems in the same field on March 15. In the San Joaquin Valley the weevil was collected easily on February 25. The larvae were not very abundant, but were generally distributed throughout the infested area.

VETCH

PEA APHID (Illinoia pisi Kalt.)

Kansas. H. R. Bryson (March 25): No pea aphids have been found this year.

Oregon. T. E. Chamberlin (March 11): Vetch fields near Hillsboro averaged 1 aphid per 100 sweeps in October-seeded vetch and 4 per 100 in volunteer vetch. The volunteer fields averaged 8 per 100 in February. Fall-seeded plots at Forest Grove show fewer aphids than in February or January and much fewer than in November. At this time in 1934, damage to common vetch was beginning to show and aphids averaged several thousands per 100 sweeps.

SUGARCANE

A MITE (Tarsonemus bancrofti Michael)

Virginia. F. F. Smith (February): On February 5 R. D. Rands brought a piece of sugarcane from an Arlington Farm greenhouse to T. E. Ewing to be examined for mites as the cause of a "rusted" appearance of the surface. This cane bore large numbers of T. bancrofti, first recognized as a pest of sugarcane in 1877 and since found in many tropical countries and islands, but not heretofore reported in continental United States. The examination revealed the presence of an associated species considered by Dr. Ewing to be new. It is of interest that other species were noted among colonies of T. bancrofti by Michael in 1890, but they were not described and apparently no specimens were preserved.

SUGARCANE BORER (Diatraea saccharalis Fab.)

Louisiana. W. E. Hinds (March 26): Sugarcane borer moths have been emerging at Baton Rouge. The first adult was taken on March 22. Survival has been reduced much below normal by the severe cold of the past winter. Cane at Baton Rouge is about 1 foot high and early planted corn is only from 6 to 8 inches high.



SUGARCANE BEETLE (Euctheola rugiceps Lec.)

Louisiana. W. E. Hinds (March 26): Sugarcane beetles are beginning to fly on warm nights. It is not yet time to estimate their abundance and probable injuriousness for this season.

F R U I T I N S E C T S

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Georgia. C. H. Alden (March 22): Larvae are still in hibernation at Cornelia. There has been no pupation to date. A high percentage is surviving the winter and it appears that there will be a moderate number of spring-brood moths.

Missouri. L. Haseman (March 25): Apples are rapidly approaching the prepink stage at Columbia and as yet no pupation has taken place in our breeding cages. Winter mortality has been low at Columbia but in the northwestern part of the State it has been reported as high in breeding cages.

EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

Connecticut. W. E. Britton (March 23): Egg clusters of the eastern tent caterpillar are very abundant throughout the State on apple and wild cherry. Specimens have been sent in from Glastonbury, Hartford, and Waterbury.

E. P. Felt (March 25): Eggs are generally abundant and the prospects are that there will be considerably larger numbers over a greater area than occurred last year under conditions that led us to believe that the outbreak had reached its peak.

New Jersey. T. J. Headlee (March 23): Egg masses are extremely numerous and widely distributed throughout the State. Judging from the number of egg masses, this insect will reach the peak of its present increasing cycle this year. However, a good many egg masses found are not viable.

Pennsylvania. T. L. Cuyton (March 28): Egg masses of the eastern tent caterpillar are very numerous on wild cherry in Pike and Monroe Counties.

Tennessee. G. M. Bentley (March): The eastern tent caterpillar is generally distributed over the State. Small tents were just appearing on March 20.

J. U. Gilmore (March 20): The first small web of the season was seen in wild cherry at Clarksville on March 20.

Arkansas. W. J. Baerg (March 7): Caterpillars of the eastern tent caterpillar began emerging at Fayetteville on March 6, a few of them probably on March 5. Judging by the number of egg masses, the species will be about as abundant this year as it was last.

Kansas. H. R. Bryson (March 25): E. G. Kelly reports that the eggs of the tent caterpillar were very plentiful in wild plums and sand plums from March 1 to 4, in Ford, Edwards, Comanche, Gray, and Finney Counties.

#### FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

Connecticut. P. Garman (March 23): Eggs are abundant locally around Wallingford.

New York. P. J. Parrott (March 23): Egg masses of the fruit tree leaf roller are probably more common in western New York and the Hudson Valley than usual.

#### APHIDS (Aphidae)

Connecticut. P. Garman (March 23): Eggs of Anhis pomi DeG. and Anuraphis roseus Baker are present in most orchards and are moderately abundant, more so than last year.

Virginia. W. J. Schoene (March 25): The green aphid is appearing in considerable numbers in Blacksburg, Montgomery County, and in Monroe, Amherst County. No rosy aphids have been noticed.

Pennsylvania. H. N. Worthley (March 29): Aphid eggs are moderately abundant at State College. They started hatching on March 24, before any apple buds showed green tips.

Ohio. T. H. Parks (March 23): Overwintering eggs of apple tree aphids are not very abundant. Hatching of the apple grain aphid (Rhopalosiphum prunifoliae Fitch) has commenced in southern counties.

Wisconsin. E. L. Chambers (March 20): Shipments of apple trees received from apple-tree-growing States of the Southwest show heavy infestation of root galls of the woolly apple aphid (Eriosoma lanigerum Hausm.) on certain varieties.

Missouri. L. Haseman (March 26): Apple grain aphids began hatching at Columbia and Louisiana about March 15 and are now quite abundant in some orchards.

#### SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

New York. P. J. Parrott (March 23): The San Jose scale is very abundant at Geneva.

Georgia. O. I. Snapp (March 22): The percentage of live scale on peach

trees around Fort Valley has not yet been lowered by cold weather. The minimum temperature this winter was 16° F. on December 12. The percentage of live scale ran as follows: December 17, 86.7; January 14, 86.3; February 23, 83.8; and March 21, 79.3. The slight decrease in the percentage between December 17 and March 21 was due to the work of the twice-stabbed ladybeetle (Chilocorus bivulneris Muls.)

C. H. Alden (March 22): The San Jose scale has been moderately abundant in apple and peach orchards and is still prevalent in uncared-for orchards around Cornelia.

Ohio. T. H. Parks (March 23): The San Jose scale is more abundant than usual and dormant spraying is now in full swing.

Indiana. J. J. Davis (March 21): San Jose scale has been reported very abundant from isolated localities throughout the State. More than the usual number of inquiries have come from northern Indiana, where the scale appears to be gaining a foothold.

Wisconsin. E. L. Chambers (March 20): The San Jose scale survived the winter in much more than normal numbers in the southern part of the State. More than 6,000 trees and shrubs are being sprayed in White-water. The work was begun on March 18. This is the third city-wide spray campaign carried on by the State in this city, the two previous ones being in 1924 and 1915. After 8 or 9 years the scale builds up so heavy an infestation that the growing of trees and shrubs is impossible without spraying.

Mississippi. C. Lyle (March 22): Inspector W. L. Douglass, Grenada, states that the San Jose scale has been more prevalent in that district than usual. He has observed several trees that have been killed since last year, especially in orchards that were not sprayed in 1932-33. Inspector H. D. Peets, Brookhaven, and M. L. Grimes, Meridian, report medium to severe damage on unsprayed fruit trees.

Arizona. C. D. Lebert (March 21): Several small but severe infestations of the San Jose scale on roses have been reported from Phoenix and Scottsdale.

#### FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Ohio. T. H. Parks (March 23): More than the usual number of specimens of the flat-headed apple tree borer have been brought in by anxious tree owners. Injury was especially severe to young trees set out 1 year ago. Roadside plantings of shade trees have also suffered.

Indiana. J. J. Davis (March 21): Reported as abundant and severely damaging maples and apple in numerous localities in the State.

Illinois. W. P. Flint (March 20): More than the usual number of reports



of damage by this species and also by the round-headed borer (Saperda candida Fab.) in apple trees have been received.

Nebraska. M. H. Swenk (March 20): The flat-headed apple tree borer was found working in young apple trees in Platte and Dawson Counties on March 8 and 16, respectively.

#### EUROPEAN RED MITE (Paratetranychus vilosus C. & F.)

Connecticut. P. Garman (March 23): Eggs are present in most orchards and abundant in some in New Haven County.

#### PEACH

#### PLUM CURCULIO (Conotrachelus nemophar Hbst.)

Georgia. O. I. Snapp (March 22): As a result of the heavy infestation at Fort Valley last year, when two generations occurred, the hibernating population was larger than usual; therefore a heavy infestation is anticipated this year. The hibernation season was a favorable one for the curculio. Adult curculios began leaving hibernation this year in advance of full bloom, which occurred on March 17 on Elbertas and Hileys, and by March 22 they had reached the center of the orchards and were disseminated throughout. The petal-fall spray will be applied beginning March 25, and is an important application this year on account of the early appearance of the curculio, relative to blooming of peaches. The infestation is heavier than usual.

C. H. Alden (March 22): No curculios have been found in peach orchards at Cornelia to date. In 1934 the first curculios were caught on April 9. Elbertas are now in full bloom, about 10 days earlier than last year.

T. L. Bissell (March): Jarring peach and wild plum for the plum curculio started on March 13 at Experiment. The first curculio was jarred from wild plum on March 23 and from cultivated plum on March 24. Five curculios were jarred from 15 peach trees on March 25.

#### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Georgia. C. H. Alden (March 22): Oriental fruit moth larvae are still in the hibernating cocoons at Cornelia.

#### PEACH BORER (Aegeria exitiosa Say)

Ohio. T. H. Parks (March 23): Injury is severe at the present time. Back-yard trees are widely infested.

Mississippi. C. Lyle (March 22): Inspector Jack Milton reports that the peach borer is very abundant in the central part of the State and that

some of the trees have been almost completely killed by it. Inspectors F. A. Smith, Senatobia, N. D. Peets, Brookhaven, and M. L. Grimes, Meridian, report medium to severe damage to plum and peach trees in their districts.

LESSER PEACH BORER (Aegeria pictipes G. & R.)

Kansas. H. R. Bryson (March 25): Peach trees planted as an intercrop in one orchard in northeastern Kansas showed the lesser peach tree borer to be abundant on March 1.

PLUM

PEAR THRIPS (Taeniothrips inconsequens Uzel.)

Oregon. S. C. Jones (March 21): On March 14 the first prune thrips was found on the first breaking buds of prune trees near Independence. On March 18 a few thrips were found in prune buds picked near Roseburg and thrips were also emerging in prune orchards at Forest Grove.

California. S. Lockwood (March 9): A survey of the pear and plum orchards in the Sacramento River Valley south of Sacramento was made yesterday and no pear thrips was found.

RASPBERRY

BLACK VINE WEEVIL (Brachyrhinus sulcatus Fab.)

California. L. M. Smith (March 15): The black vine weevil occurs in considerable numbers in raspberry patches in the Santa Clara Valley. At the present time approximately 70 percent of the larvae have pupated.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

California. S. Lockwood (March 25): In the Coachella Valley, Riverside

County, the grape leafhopper is much more prevalent than at this time last year. In the vineyards in the Imperial Valley it is about the same as last year, but is far more than normally abundant.

### PECAN

#### PECAN LEAF CASE BEARER (Acrobasis juglandis LeB.)

North Carolina. R. W. Leibv (March 21): An examination of 700 buds on pecan twigs from the largest orchard in the State shows 87 cases per 100 buds. This is slightly higher than the average for the last 8 years and forecasts some damage to pecan growth in spring.

#### PECAN CARPENTER WORM (Cossula magnifica Stkr.)

Georgia. T. Bissell (March 21): On February 11 at Forsyth an orchard of 17 pecan trees about 15 years old was examined and 10 trees contained 12 worms. This is the heaviest infestation ever observed. On March 9 at Experiment in an orchard of 30 trees 27 years old 1 worm was found in 1 tree. On March 14 at Barnesville an orchard of 250 trees about 10 years old showed 3 trees containing 1 worm each.

### CITRUS

#### GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (March 23): Citrus aphids are increasing in numbers, and while most of the spring growth on oranges and grapefruit is too far advanced to be endangered, they may do commercial damage to tangerines.

#### COWPEA APHID (Aphis medicaginis Koch)

Arizona. C. D. Lebert (March 21): A. medicaginis is numerous on new growth of citrus trees, but is not considered as very important.

#### CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (March 21): Several small infestations have been found in ornamentals in Phoenix yards recently. The infested plants were removed and destroyed and all adjacent plants were sprayed.

#### COTTONY CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (March 22): On March 19 Inspector H. Gladney, of Ocean Springs, wrote as follows: "A few light infestations on citrus



are scattered along the southern edges of Jackson and Harrison Counties. Vedalia ladybird beetles (Rodolia cardinalis Muls.) were observed feeding at some of the places."

Arizona. C. D. Lebert (March 21): This scale is active in several citrus groves and was very abundant on some ornamentals on March 1. Vedalia activity was noted today for the first time. Some Cryptochaetum icerrae Williston were liberated 2 weeks ago and the activity of this parasite was also recorded today.

CHAFF SCALE (Parlatoria pergandei Comst.)

Mississippi. C. Lyle (March 22): On March 19 Inspector H. Gladney wrote that heavy scattered infestations have been observed on citrus in Jackson and Harrison Counties.

A SCALE INSECT (Margarodes sp.)

Florida. J. R. Watson (March 23): The margarodes on the roots of citrus trees are beginning to emerge and lay eggs.

HOLCOCERA MOTH (Holcocera iceryaeella Riley)

California. H. J. Ryan (March 26): Larvae are present in numbers on the orange fruit in Los Angeles County, but they have not started boring into the fruit. The orange tortrix (Tortrix citrana Fern.) has not done any damage.

CITRUS RED SPIDER (Paratetranychus citri McG.)

California. H. J. Ryan (March 26): The infestation of the citrus red spider on citrus in Los Angeles County has built up rapidly and quite a little spraying has been done to control it.

## TRUCK - CROP INSECTS

### VEGETABLE WEEVIL (Listroderes obliquus Gyll.)

Alabama. J. M. Robinson (March 25): The vegetable weevil continues to be abundant in central and southern Alabama and is attacking vegetables in the Birmingham trucking area.

Mississippi. M. M. High (March 7): The vegetable weevil is causing serious injury to turnips, carrots, and a number of other vegetables along the Gulf coast. The weevils became active about the middle of October and egg laying started the latter half of October. Heavy oviposition took place in November, December, January, and February.

C. Lyle (March 22): Inspector N. D. Peets, of Brookhaven, states that carrots and turnips in his district have been rather heavily damaged by larvae, and inspector M. L. Grimes, of Meridian, reports that larvae and pupae are very abundant in the soil in certain gardens, although no vegetables are present for the larvae to feed upon.

Louisiana. P. K. Harrison (March 15): The vegetable weevil was causing slight injury to young cabbage plants near Westwego.

### CUCUMBER BEETLES (Diabrotica spp.)

Virginia. H. G. Walker (March 23): Twelve-spotted cucumber beetles (D. duodecimpunctata Fab.) were quite common in kale, collard, and spinach fields at Norfolk on March 21.

Georgia. T. L. Bissell (March 17): Beetles (D. 12-punctata) are common on rye and wild plum blossoms at Experiment.

Florida. J. R. Watson (March 23): D. balteata Lec. is found on various crops well distributed over the State.

Mississippi. C. Lyle (March 22): Inspector Jack Milton, of Jackson, wrote on March 19 as follows: "A truck-crop grower in Rankin County reports that the 12-spotted cucumber beetle is causing some injury to his plants." Inspector M. L. Grimes reports that he has observed these beetles on volunteer vegetables in the vicinity of Meridian.

M. M. High (March 1): The southern corn root worm beetle was very abundant on turnip and other cruciferous crops along the Gulf coast during January and February. The belted cucumber beetle (D. balteata) was fairly abundant in southern Mississippi on turnip, mustard, cabbage, and related crops during February.

### SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Virginia. H. G. Walker (March 23): Adults of the seed corn maggot are very abundant in the Norfolk area.

California. H. E. Campbell (February 28): The seed corn maggot is attacking sweet corn in the Alhambra district. Five acres of early planted corn seed were destroyed, necessitating the replanting of the entire field.

TARNISHED PLANT BUG (Lygus pratensis L.)

Virginia. H. G. Walker (March 23): Tarnished plant bugs were found feeding on collards on March 21 at Norfolk.

Tennessee. G. M. Bentley (March): Tarnished plant bugs are general in narcissus plantings at Chattanooga and Knoxville.

CHANGA (Scapteriscus vicinus Scudd.)

North Carolina. W. A. Thomas (February): During the month many complaints have reached the laboratory of rather severe injury to seed beds by mole crickets. The imported mole cricket has now increased in population to the point where control measures are necessary to protect young seedling plants. This is especially true of seed beds protected somewhat from sudden changes of temperature, where there is usually an abundance of decaying vegetable matter, and where moisture conditions are favorable.

GARDEN CENTIPEDE (Scutigera immaculata Newp.)

California. A. E. Michelbacher (March 21): The garden centipede has been very destructive this year. It has done considerable damage to germination stands of sugar beets and onions in the Sacramento River Delta. Several hundred acres of beets have been severely injured and many fields destroyed. In some instances barley has been injured, although not seriously.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Mississippi. C. Lyle (March 22): Inspector L. J. Goodgame reports that the first Colorado potato beetles were observed in Prentiss County on March 14. Inspector N. D. Peets indicates that he has not yet observed any of these beetles in the vicinity of Brookhaven.

E. W. Dunnam (March 25): Adult Colorado beetles have been noticed for the first time this season in Washington County.

Louisiana. W. E. Hinds (March 26): Colorado potato beetles are attacking tomatoes lightly around Baton Rouge. There are no potatoes nearby.

C. E. Smith and P. K. Harrison (March 29): Adults that overwintered are quite abundant in several home gardens in the vicinity of Baton Rouge and in the experimental plots at the Louisiana State University. Larvae about one-third grown were found in one home garden.



TOMATO PINWORM (Gnorimoschema lycopersicella Fusck)

California. J. C. Elmore (March 11): In the Santa Ana district 217 moths were collected from 8 piles of old tomato plants, the piles being 3 by 4 feet in area. These plants were piled up about January 17. Adults were collected from cages set over the material. In the same area a large pile of tomato plants which were taken from the field November 2, 1934, was still harboring pinworm moths, 7 moths being taken from 36 square feet. Tomato plants set out under paper caps on February 1 were pushing through the paper by March 11. Five hundred acres of tomatoes in the Santa Ana district are at this stage of development. A general field examination was made in the San Juan Capistrano district March 13 and 55 acres of tomatoes under half paper caps were found to be infested. There were 150 acres of tomatoes set out under paper in this locality on February 1.

TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Arizona. V. E. Romney (February): During February adults and eggs were found on four additional species of Lycium. L. fremonti, L. exsertum, L. parishii, and L. californicum were found to harbor a few potato psyllids, but not to such an extent as in L. andersonii. The first brood of psyllids for the current season was completed by the latter part of February. The nymphs present were small ones that had recently hatched. The number of eggs now present on L. andersonii is very high, although coccinellid and chrysopid larvae have been noticed on the bushes.

PEAS

PEA APHID (Illinoia pisi Malt.)

California. R. E. Campbell (March 18): The pea aphid is doing considerable damage to market peas in Santa Barbara and San Luis Obispo Counties. One 100-acre field observed will be a total loss unless the aphids are destroyed. Recent rains have promoted the aphid fungus in some fields and syrphid larvae are numerous, but any reduction in the number of aphids by these natural enemies usually occurs after considerable damage has been done. The Pacific Rural Press of March 16 reports as follows: "Pea growers in the Milpitas district are threatened with heavy losses by aphids, and a scout has been sent to the Sierra Nevadas to procure 25,000 of ladybugs to attack and destroy the aphid horde."

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Virginia. H. G. Walker (March 23): Imported cabbage butterflies have been active in kale and collard fields at Norfolk for some time.

Tennessee. G. M. Bentley (March): Generally distributed over eastern Tennessee.

Mississippi. C. Lyle (March 22): Inspector N. D. Peets reports medium damage

to cabbage in Caniah and Lincoln Counties.

Louisiana. W. E. Hinds (March 26): Cabbage butterflies and their eggs are unusually scarce at Baton Rouge.

C. E. Smith (March 13): At Baton Rouge a light infestation of larvae was found on cabbage plants that had been transplanted to the field since the freeze of January 21-26.

P. K. Harrison (March 15): Not one larva or adult was found on cabbage in southern Louisiana near Westwego.

Missouri. L. Haseman (March 26): First imported cabbage butterfly on the wing was seen at Columbia March 23. The insect is now increasing in numbers.

#### CABBAGE LOOPER (Autographa brassicae Riley)

Louisiana. C. E. Smith (March 13): The cabbage looper is very scarce in the vicinity of Baton Rouge.

P. K. Harrison (March 15): Not a single specimen of cabbage looper was found on cabbage plants near Westwego.

W. E. Hinds (March 26): No cabbage loopers have yet appeared at Baton Rouge.

#### DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker (March 23): All stages of the diamond-back moth are present in kale and collard fields at Norfolk. Angitia hellulae Vier. is also very abundant and it is believed that this parasite will be able to keep the moth in check this spring.

Mississippi. M. M. High (March 7): The larvae were quite abundant on experimental plats of turnips at Biloxi and on cabbage at Gulfport during January and February.

Louisiana. C. E. Smith (March 13): Larvae were found on collards and cabbage that survived the severe freeze of January 21-26 at Baton Rouge and vicinity.

P. K. Harrison (March 15): Field observations and examinations show very little injury to cabbage. Very few larvae were found on young cabbage plants in one field of approximately 300 acres near Westwego.

#### CROSS-STRIPED CABBAGE WORM (Evergestis rimosalis Guen.)

Mississippi. M. M. High (February 19): The cross-striped cabbage worm was

observed attacking cabbage and turnip about Biloxi and Gulfport.

HARLEQUIN BUG (Murgantia histrionica Hann)

Virginia. H. G. Walker (March 23): Only two harlequin bugs have been found at Norfolk this spring, indicating that they are rather scarce.

L. W. Brennan (February 26): A large number of examinations were made in trash and other debris in and near collard patches for adults of the harlequin bug in hibernation at Norfolk. Only one adult was found and it was beneath dead leaves and grass along the edge of the patch. No live adults were observed. The temperature at the time of the observation was 60° F. In similar examinations in another garden where dead leaves covered the ground near one end of the patch, no live adults were found. Examinations were then made in pine woods near the collard patches in order to determine whether any adults had flown to the woods for hibernation. No adults were found beneath pine needles and leaves.

Alabama. J. M. Robinson (March 25): Large numbers of overwintered adults have appeared on cabbage and turnips at Auburn.

Louisiana. W. E. Hinds (March 26): Harlequin cabbage bugs are very abundant at Baton Rouge on old stalks of cabbage and collard. Eggs are abundant.

CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Walker (March 23): A few specimens of Myzus persicae Sulz. and B. brassicae were found feeding on old collards at Norfolk but none were found on spinach.

North Carolina. W. A. Thomas (February): Cabbage aphids have shown up in considerable numbers on overwintering collards and young cabbage, necessitating control measures.

Mississippi. C. Lyle (March 22): The cabbage aphid was observed recently on cabbage plants in Rankin County near Florence. Although the infestations were spotted in the fields, the plants attacked were badly damaged. Medium damage to cabbage in Lincoln and Copiah Counties has been reported.

TURNIP APHID (Brassicae aphid Davis)

Louisiana. W. E. Hinds (March 26): Aphids, presumably this species, are abundant on some small plots of cabbage at Baton Rouge, but not generally distributed.

SEED CORN BEETLES (Agonoderus spp.)

Virginia. H. G. Walker (March 23): Hundreds of Agonoderus beetles, probably A. lineola Fab. and A. pallipes Fab., were observed flying over collard



and kale fields at Norfolk on the afternoon of March 21, and were very abundant around lights that night.

#### FLEA BEETLES (*Halticinae*)

Virginia. H. G. Walker (March 23): A large number of cabbage flea beetles are present in kale and collard fields at Norfolk.

Louisiana. W. E. Hinds (March 26): Phyllotreta vittata Fab. is very abundant on mustard and turnips coming up.

#### CELERY

##### GREENHOUSE LEAF TIER (Phlyctaenia rubigalis Guen.)

Florida. C. F. Stahl (February): One thorough survey of the celery area was made during the month to determine the abundance and distribution of the celery leaf tier. This was done on February 8, at the beginning of the few days of very warm weather. At that time the only places showing the presence of the insect were a few fields of mature celery immediately south of Lake Monroe, where from 6 to 15 moths per row were flushed by sweeping.

#### ONIONS

##### ONION THRIPS (Thrips tabaci Lind.)

Florida. J. R. Watson (March 23): There is an extremely heavy infestation of onion thrips on celery in Sarasota County where severe damage is being done. The thrips are also attacking beans in Sarasota County and the lower eastern coast. The usual damage to onions is noticeable all over the State.

Louisiana. P. E. Harrison (March 18): Onions are being rather heavily infested in the vicinity of Baton Rouge.

#### STRAWBERRY

##### STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Kansas. E. R. Bryson (March 1): Strawberry leaf rollers passed the winter in good condition in northeastern Kansas.

##### STRAWBERRY ROOT APHID (Aphis forbesi Weed)

Virginia. H. G. Walker (March 23): At Norfolk a large percentage of the overwintering eggs have hatched and the young aphids are feeding mostly on the stems and undersides of the leaves.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker (March 23): The red spider continued to be rather abundant in a great many strawberry fields in the Norfolk area and on the Eastern Shore of Virginia.

BEETBEET LEAFHOPPER (Eutettix tenellus Bak.)

Colorado and Utah. W. A. Shands and O. A. Hills (February): Observations near the end of February indicated that no germination of spring host plants had occurred in the general breeding area but that it could be expected within a few days; also that little mortality of E. tenellus occurred during the past winter in the Grand Valley of Colorado. It is reasonable to expect that similar survivals obtained over the breeding area of southeastern Utah.

Utah. G. F. Knowlton (March 14): Beet leafhoppers are more than usually abundant in the breeding areas of Box Elder County, south of Lamo and west of Corinne.

General. E. W. Davis (February): Filaree was found in southwestern Utah at Leeds and at Santa Clara. A few scattered plants on the uplands were of recent germination and no leafhoppers were found on them. At the station at Leeds 7 leafhoppers were found in 14 square feet; at Saint George, 9 per 16 square feet; and at Santa Clara, 1 was found. In a section northwest of the Indian reservation, where a large number were found last fall on sheepweed, only one was found. On beets in the Saint George area 10 leafhoppers per 20 square feet were found. In the southern Nevada section the creosote bush was quite dry and in many places exceedingly brown. In the Dry Lake section, which normally germinates some filaree, no annuals were present. South of Las Vegas the creosote bush was somewhat greener and some wild mustard was germinating around the base of the bushes. However, no leafhoppers could be found in this area. On the road south of Las Vegas toward Searchlight it was extremely dry and no annuals had germinated. In the Arizona section of the perennial breeding area, we found that the filaree had germinated from high on the hill slopes, down to the broad flats. Filaree was also found between Littlefield, Ariz., and Mesquite, Nev., in small areas. Twenty-five miles southwest of Saint George, Utah, on the hillside, two 10-square-foot samples did not show any leafhoppers. Farther down on the flat none were found. The filaree in this area was more or less of recent germination; that is, it germinated late last fall. Leafhoppers were found only in those patches that germinated from the November rainfall. In most of these places the areas that supported leafhoppers were covered in making these checks. In dissections of the females it was found that practically three-fourths had matured eggs. At Lovendale, Nev., no leafhoppers were found on beets. On Russian-thistle 1 inch high, one leafhopper in 10 square feet was found, but very little Russian-thistle was germinated in this area.

California. H. E. Wallace (February): Early in February there was an influx of beet leafhoppers into the beets around King City. The writer visited the area on February 12 and 13 and made several counts in the field. The average population found, considering all counts, was 9 bugs per 100 square feet of row of unthinned beets, a population sufficiently large to indicate potential damage on unthinned beets on the 1,600 acres in the district. The majority were females of the overwintering generation.

## FOREST AND SHADE - TREE INSECTS

### CANKER WORMS (Geometridae)

Connecticut. E. P. Felt (March 25): Fall canker worms (Alsophila pometaria Harr.) are locally abundant, though mostly in areas adjacent to the sections where there was extensive defoliation last year. A number of the females did not appear until spring and on March 24 they were observed laying eggs. The spring canker worm (Paleacrita vernata Peck) occurs locally but is not so common as the fall canker worm.

W. E. Britton (March 23): Eggs of the fall canker worm are very abundant in the vicinity of New Haven and have been received from Bethany, Bridgeport, Groton, and Woodbridge. There may be serious defoliation in May.

New Jersey. T. J. Headlee (March 23): Both species of canker worm are increasing. This morning I found a female spring canker worm laying eggs.

Illinois. W. P. Flint (March 20): Canker worm moths were flying in rather large numbers on the night of February 27 and again on the night of March 19.

Missouri. L. Haseman (March 25): Male moths of the spring canker worm have appeared at Columbia now and then on warm nights since sometime in January. The moths are still abundant.

A. F. Satterthwait (February 25): The spring canker worm is now in flight at Webster Groves. One was observed on February 15. By February 21 many were in flight.

Kansas. H. R. Bryson (March 22): Canker worms are abundant in a number of localities. Several thousand trees were banded and counts revealed from 400 to 600 moths on representative bands. The majority of the moths are out, but the bands still catch a few late stragglers.

### FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Colorado. G. W. List (March 19): Eggs are much less numerous in northern Colorado cities than they have been for two seasons. Little injury is expected this year.



BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Ohio. E. W. Mendenhall (March 16): In examining cocoons of the bagworm in the central and southern parts of the State I find the eggs have overwintered very well and it looks as though there will be a heavy infestation this season.

Indiana. J. J. Davis (March 21): Many inquiries from as far north as La Fayette have been received regarding the abundance of the bagworm.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Maryland. E. N. Cory (March 26): An unusual swarming into a house in Baltimore County was noted.

A BARK BEETLE (Scolytus multistriatus Marsham)

Connecticut. B. J. Kaston (March 23): Dead adults were found at New Haven in brood tunnels on February 11. Live hibernating larvae, apparently almost ready to pupate, were also present. This species is relatively uncommon, as compared with the native bark beetle Hylurgopinus rufipes Eich. This native bark beetle is apparently much more numerous in the eastern part of the State, becoming more common the farther east one collects. Many dead adults were found in egg galleries especially in the town of Old Lyme. Some young scolytid imagoes were found dead in the pupal cell. There are many hibernating larvae but no pupae.

ELM BORER (Saperda tridentata Oliv.)

Connecticut. B. J. Kaston (March): Half-grown and larger larvae are common. In one tree at Danielson on March 18 almost every tunnel contained a pupa of an unidentified hymenopterous parasite.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Wisconsin. E. L. Chambers (March 20): The European elm scale is making its appearance in a few additional localities in southern Wisconsin each year. It is still confined to 8 or 10 cities where spraying is carried on each year. Madison has sprayed practically all the elm trees in the city this spring.

Colorado. G. M. List (March 19): The European elm scale has been on the increase during the last two or three seasons. It now occurs in practically all sections of the State where elms are grown. The indications are that the winter mortality has been very low.

PUTNAM'S SCALE (Aspidiotus ancylus Putn.)

Connecticut and New Jersey. E. P. Felt (March 25): Putnam's scale was

received from Tuttle, H. J., on a piece of elm bark, showing a rather severe infestation. A scale, presumably this species, was found in great abundance on flowering dogwood at Wilton, Conn.

OBSURE SCALE (Chrysomphalus obscurus Comst.)

Tennessee. G. M. Bentley (March): At Knoxville adults of Chilocorus biulnerus Muls. were numerous and were feeding on the obscure scale on elm.

PINE

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Wisconsin. E. L. Chambers (March 20): Specimens of the pine needle scale are being sent in from many localities in southern Wisconsin and all seem to have escaped injury from the mild winter.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

A FLOWER THRIPS (Frankliniella cephalica Cwfd.)

Florida. J. R. Watson (March 23): The flower thrips F. cephalica is very abundant in most blossoms. With the advent of abnormally dry and hot weather in March, the increase has been very rapid. The thrips is found in large numbers on ornamentals.

OYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

New York. R. E. Morsey (March 21): On March 13 the oyster-shell scale was common on a large ornamental planting of rosemary willow (Salix incana) at Rochester, almost every shrub being infested. It was also found on poplar trees nearby, but was not common.

Indiana. J. J. Davis (March 21): The oyster-shell scale has been reported as abundant on lilac and ash in the northern half of the State.

Colorado. G. M. List (March 19): The oyster-shell scale was less numerous this past season than for some time, but apparently the eggs have wintered well and we expect some increase, especially on lilac and ash.

ARBORVITAE

ARBORVITAE APHID (Dilachnus thujaefilina Del Guer.)

Mississippi. C. Lyle (March 22): Inspector M. L. Grimes reports that aphids, probably this species, are becoming abundant on arborvitae plants in the vicinity of Meridian.

Louisiana. W. E. Hinds (March 26): Arborvitae aphids are abundant on certain shrubs and their presence is indicated by the abundance of flies and wasps swarming around the infested plants.

COMMON RED SPIDER (Tetranychus telarius L.)

Louisiana. W. E. Hinds (March 26): Red spiders are abundant and are destroying young growth on arborvitae and cedars at Baton Rouge.

CAMPHOR

CAMPHOR THRIPS (Cryptothrips floridensis Watson)

Mississippi. C. Lyle (March 22): On March 15 inspector G. L. Bond reported rather general and severe injury to camphor trees at Lucedale.

DEODAR

DEODAR WEEVIL (Pissodes deodarae Howk.)

Mississippi. C. Lyle (March 22): Inspector M. L. Gires reports injury to plantings of Cedrus deodara in Meridian. A report of injury was also received from Hazlehurst on February 23.

EUONYMUS

EUONYMUS SCALE (Calionaspis euonymi Comst.)

Virginia. H. G. Walker (March 23): The euonymus scale is very abundant in the Norfolk area.

North Carolina. R. W. Leiby (March 21): This scale is being reported more frequently this spring than usual. Damage is severe.

Mississippi. C. Lyle (March 22): On March 19 Inspector Jack Milton wrote as follows: "Practically all of the euonymus plants in Jackson show from light to heavy infestation."

HOLLY

HOLLY LEAF MINER (Phytomyza ilicis Curt.)

Tennessee. G. M. Bentley (March): A serpentine leaf miner is working in the leaves of Ilex opaca.

NARCISSUS

LESSER BULB FLY (Eumerus tuberculatus Bond.)

Tennessee. G. M. Bentley (March): The bulb fly is general in narcissus plantings at Chattanooga and Knoxville.



NARCISSUS BULB FLY (Merodon equestris Fab.)

Washington. R. Schoon and C. F. Doncette (February): Pupation had started when the first seasonal observations were begun at Sumner on February 26. However, only 7.15 percent of the samples examined were pupae. Most of the remainder were still in the larval stage in the bulbs.

A BULB THRIPS (Liothrips vaneeckei Priessner)

Washington. R. Schoon (February): Throughout the month the proportions of thrips in the several stages were very near what appears to be normal for the winter; that is, nearly 50 percent each of adults and second-instar larvae and 2 or 3 percent of first-instar larvae. No eggs or pupae have been found. Apparently the cool weather, with occasional frost and light freezing, has kept the soil temperature low enough to prevent any perceptible development. There has been little change in the proportion of the sexes.

BULB MITE (Rhizoglyphus hyacinthi Edv.)

Tennessee. G. M. Bentley (March): The bulb mite is general in narcissus plantings at Chattanooga and Knoxville.

PERIWINKLE

LILY APHID (Myzus circumflexus Buckton)

California. E. O. Essig (March 22): The lily aphid was common on Vinca major at Blocksburg on March 20 and on the same host at Berkeley on March 10.

RHODODENDRON

RHODODENDRON WHITEFLY (Dialeurodes chittendeni Laing)

Washington. R. Latta (February): Weekly observations at Sumner have shown a gradual change from second-instar to third-instar larvae, but pupae are in about the same proportion as in January. Sooty mold is beginning to show on the undersides of heavily infested leaves. On February 11 a large ornamental planting of rhododendron at the Highlands, Seattle, was sprayed. On February 26 spraying was started on another estate at the Highlands. There are over 1,500 plants on this place, practically all of them carrying more or less infestation. On this date a few heavily infested plants in a small ornamental planting were sprayed.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

ORIENTAL RAT FLEA (Xenopsylla cheopis Rothsch.)

Iowa. C. J. Drake (March 23): R. L. Roundabush collected the tropical rat flea in Ames on March 22. His observations show that the insect survives Iowa winters.

BOXELDER BUG (Leptocoris trivittatus Say)

Maryland. E. M. Cory (March 26): The boxelder plant bug was reported from Easton.

Ohio. J. S. Houser (March 18): Reports of this insect in dwellings were received from many parts of Ohio during the winter.

Indiana. J. J. Davis (March 21): The boxelder bug has been reported annoying in homes in many sections of the State, especially in northern Indiana, during the past month.

Kentucky. W. A. Price (March 23): Boxelder plant bugs have been the source of worry to housewives during February and March.

Wisconsin. E. L. Chambers (March 20): With the appearance of a few warm days, the boxelder bug is showing up from one end of the State to the other, wherever the boxelder tree is grown extensively.

South Dakota. H. C. Severin (March 14): The boxelder bug is very abundant in eastern part of the State and is causing much annoyance.

Iowa. C. J. Drake (March 23): The boxelder bug is extremely abundant over the State. Many people are asking how they can keep the bugs out of houses.

Nebraska. M. H. Swenk (March 20): Complaints of annoyance by the boxelder bug were received from Dixon, Pierce, Stanton, Rock, Sherman, Colfax, and Sevier Counties from February 21 to March 19.

Kansas. H. R. Bryson (March 25): Boxelder bugs are scarcer at Manhattan this year than they have been for several years.

Colorado. G. M. List (March 19): The usual number of inquiries have been received this winter and spring.

Utah. G. F. Knowlton (March 25): Boxelder bugs are reported as unusually abundant and annoying at Cedar City and other parts of Iron County. They are also very abundant and annoying in homes at Mendon.

PAINTED HICKORY BORER (Cyllene caryae Gahan)

Illinois. C. L. Metcalf (March 14): A number of cases of annoyance in houses where hickory for firewood has been stored in the basement have been reported.

ROCKY MOUNTAIN SPOTTED FEVER TICK (Dermacentor andersoni Stiles)

Idaho. J. R. Douglass (March 8): A male specimen taken from a human was brought into the laboratory on March 6.

BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

Kentucky. W. A. Price (March 23): Black widow spiders are prevalent in the vicinity of Lexington. One adult female was taken from a new house on December 10, and in February five half-grown specimens were collected in the basement of the same house. A number of specimens have been brought into the laboratory during the past few months.

South Dakota. H. C. Severin (March 14): Considerable uneasiness has been aroused in South Dakota over the black widow spider. Specimens have been sent in from many localities. One individual reported taking 20 specimens from his basement, two of which were sent us for examination.

Nebraska. M. H. Swenk (March 20): A specimen of the black widow spider was sent in by a Frontier County correspondent on March 2.

Utah. G. F. Knowlton (March 19): Black widow spiders have been observed surviving the winter in a greenhouse at Logan.

CATTLE

SCREW WORMS (Cochliomyia spp.)

Alabama. J. M. Robinson (March 25): The screw worm was reported as active on young calves near Auburn during the third week of March.

Texas. H. E. Parish (February 22): Our records show that C. macellaria Fab. can survive temperature as low as 11° F. at Menard.

CATTLE GRUBS (Hypoderma spp.)

Missouri. L. Haseman (March 26): In the central part of the State most of the grubs of the ox warble have now left the backs of cattle.

Kansas. H. B. Bryson (March 25): An examination of cattle in Finney, Gray, and Comanche Counties on March 1-4 showed that the larvae of H. lineatum DeVill. had not all dropped from the animals.

Texas. H. E. Parish (February 22): Heel flies were very active during February. The first activity was noted on February 4.



BLACK BLOWFLY (Phormia regina Meig.)

Texas. H. E. Parish (February 22): Larvae collected on January 5 and kept under outdoor laboratory conditions produced adults on January 30. The larvae were collected from dehorned calves and exposed to temperatures as low as 11° F. The fly was active during the warm days in February. One case of myiasis caused by this fly was observed on February 18.

BUFFALO GNATS (Eusimulium pecuarum Riley)

Mississippi. C. Lyle (March 22): On March 20 inspector W. L. Douglas, Grenada, wrote as follows: "Buffalo gnats have been showing up for about 2 weeks, especially in the overflow land and adjacent territory. I notice that they are showing up farther back in the hills than usual, as I have observed them on several occasions about 20 miles east of Grenada, near the Calhoun County line."

Arkansas. H. H. Schwardt (March 22): The southern buffalo gnat appeared in Miller County the last week in January. On February 19 gnats were seen in Mississippi County and during the week of March 3 to 9 local outbreaks occurred in Mississippi, Craighead, Phillips, and Miller Counties. The gnats were most numerous in Miller County. Farm work was stopped in several localities, but no loss of livestock was reported or seen.

BROWN WINTER TICK (Dermacentor nigrolineatus Pack.)

Texas. H. E. Parish (February 22): The winter horse tick was very abundant on horses during the first part of February in Menard County. Recent observations indicate that many of the adult ticks are leaving the host.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

New Jersey. T. J. Headlee (March 23): The season for reporting sex forms of the common termite (R. flavipes Kol.) is now beginning and, judging from the number of reports already in, the insect is not decreasing.

North Carolina. R. W. Leiby (March 21): Complaints of termites swarming around buildings are about as common as usual. Swarming was reported first this season late in February.

Ohio. T. H. Parks (March 23): Several complaints reach our office daily. The insects have been swarming for the past 3 weeks.

J. S. Houser (March 18): A flight of adults at Wooster was

reported on March 17. These insects have increased greatly in abundance in Ohio in recent years.

Indiana. J. J. Davis (March 21): Termites have been swarming for the past 2 weeks and many inquiries have been received from all parts of the State.

Illinois. W. P. Flint (March 20): About the usual number of reports of infestation are now coming in. The same is true of powder-post beetles (Lyctus spp.).

Kentucky. W. A. Price (March 27): Termites were observed swarming in Lexington on March 11.

Alabama. J. M. Robinson (March 25): Termites are swarming at Auburn and are causing considerable concern at Gadsden.

Mississippi. C. Lyle (March 22): Inspector L. J. Goodgame states that on March 16 he observed termites flying from a building in Aberdeen, and inspector H. Gladney, of Ocean Springs, reports that the first swarm he observed this year appeared on March 18. Many complaints of damage have been received from all sections of the State during the past month.

Missouri. L. Haseman (March 26): Since the first of March we have been receiving reports of swarming termites. In all cases they have been in or alongside foundation walls of buildings.

Nebraska. M. H. Swenk (February 20 to March 20): Inquiries concerning the control of termites R. tibialis Bks. continued to be received during the period here covered. A Phelps County correspondent reported, under date of March 7, having lost a number of trees from termite attack.

#### ANTS (Formicidae)

Maryland. E. H. Cory (March 26): Three reports have been received from Baltimore of the European pavement ant (Tetramorium caespitum L.) being present in houses. (Det. by M. R. Smith.) A nuptial flight of Lasius interjectus Mayr has been recorded.

Alabama. J. M. Robinson (March 25): Several species of ants have been reported as attacking cabbage and potato plants in Baldwin and Mobile Counties. The ants are said to bite holes in the stems of the plants below the ground level. Argentine ants (Iridomyrmex humilis Mayr) are causing considerable concern at Gadsden.

Mississippi. M. R. Smith (March 1): Complaints in regard to Argentine ants have been received from Clinton and Summit. A report received from near Starkville indicates that fire ants Solenopsis xyloni McCook have been very troublesome around the hearth and chimney of a house this winter. Similar reports were received from Smithville and Rolling Fork.

Arkansas. M. R. Smith (March 21): A correspondent in Elvtheville sent specimens of the odorous house ant (Tapinoma sessile Say), which were infesting her house.

Nebraska. M. H. Swenk (March 20): A house-infesting ant new to our records was added when an abundance of Prenolepis parvula Mayr was found infesting the basement and first floor of a studio in Lancaster County on March 5. The basement ant L. interjectus was reported infesting the basement of a house in Douglas County on March 11.

Texas. M. R. Smith (March 21): Specimens of the Texas leaf cutting ant (Atta texana Buckley) were collected in the Brazos River bottoms near College Station. The ants were reported as carrying berries and leaves of yaupon (Ilex sp.) in their mandibles. Specimens of ants reported attacking trees at Seabrook proved to be Camponotus herculeanus pennsylvanicus DeG. and C. caryae rasilis Whlr. Specimens of Pharaoh's ant (Monomorium pharaonis L.), found feeding on sweets in a house at Dallas, were sent me for determination.

#### PEA WEEVIL (Bruchus pisorum L.)

Oregon. A. C. Larson (February): During the month we have made mortality examinations of weevils found in fence posts and trees near last year's pea fields in different parts of the Willamette Valley. The mortality ran from 16.6 percent in oak posts at Halser to 100 percent in similar posts at Barlow, where only two weevils, both dead, were found. The average mortality of the weevils in the 9 fields was 34.7 percent, about the same as last year, when the average mortality of weevils collected from posts during February was 35 percent. We found more weevils in apple trees at Dever than in posts at any other place.

#### BEAN WEEVIL (Acanthoscelides obtectus Say)

Wisconsin. E. L. Chambers (March 20): Reports of bean weevils are more numerous this spring than usual.

---

#### SPECIAL NOTE

#### BOLL WEEVIL (Anthonomus grandis Boh.)

Haiti. Andre Audant (January 15): The boll weevil has been discovered on the island. Within a 5-mile radius of Jacmel, about 90 percent of the bolls have been attacked. The infestation decreases from Jacmel to Port au Prince, the average loss being from 30 to 40 percent in the more heavily infested fields and from 20 to 30 percent on an average. It seems that the insect has been present at Jacmel since 1932 or 1933, but was not noticed by the peasants, who thought the heavy rains caused the falling of the bolls.





## THE TWO BROODS OF PERIODICAL CICADA SCHEDULED TO APPEAR IN 1935

Brood IX of the periodical Cicada will appear in 1935. This is a well defined brood in southern West Virginia, western Virginia, and extreme northwestern North Carolina, with scattered records throughout the remainder of West Virginia and eastward into northern Virginia and Maryland. Even less positive records of single year's appearances of this brood have been made for northern Ohio, southwestern Michigan, and northern Indiana, and Martha's Vineyard, Mass. The last was only recorded in 1833.

The unsubstantiated theory of acceleration or retardation of certain individuals of any given brood might account for some of these scattered records. This brood was first recorded in 1833 and has been recorded at every subsequent period of appearance. A. D. Hopkins, by a survey carried on in 1901, did most to delimit the range of this interesting brood which nearly exactly fills the gap between the three foci of brood X, the largest brood of the 17 year race due to appear in 1936.

Following is a list of all the records available to the Insect Pest Survey on the occurrence of this brood. Under each State the counties (underlined) are arranged alphabetically and under each county the towns are arranged alphabetically. The numerals following a town indicate the year or years the brood was recorded from that town; those after the county indicate that the record was for the county and gave no specific town or towns. Counties or towns without dates are from records of the brood without giving any particular year of appearance.

Brood IX. 1833, 1850, 1867, 1890, 1901, 1918.

## INDIANA.

Boone, Lebanon 1884; Blackford, Hartford City 1884; DeKalb, Stefford 1901; Lake, Cedar Lake 1884.

## MARYLAND.

Baltimore, Baltimore 1918; Garrett, Oakland 1901.

## MASSACHUSETTS.

Dukes 1833.

## MICHIGAN.

Cass, Edwardsburg 1901; Newaygo 1901.

NORTH CAROLINA.

Allegheny, Elk Creek 1884, Edwards Crossroads 1901, Roseland 1901, Vox 1901; Ashe 1901; Moore, Southern Pines 1918; Surry 1901, 1918; Wilkes, Wilkesboro 1850, 1867, 1901; Yadkin 1901.

OHIO.

Cuyahoga, Bedford 1901; Medina, Seville 1884, Medina Twp. 1884.

VIRGINIA.

Alexandria, Maywood 1915; Bland, 1850, 1867, 1884; Buchanan, Grundy 1901; Carroll, Waso 1901, Woodlawn 1901, Waltz 1901; Craig, Newcastle 1884; Fairfax, Great Falls 1918; Franklin 1884, Ferram 1901, Synorsville 1901; Giles 1884; Grayson 1867, 1884; Henry 1850, 1867, 1884; Lee, Ewing 1901; Loudoun\*; Montgomery 1901; Patrick, Puckett 1901, Woolwine 1918; Pulaski 1850, 1867, 1884, New River Depot 1901, Newbern 1884; Roanoke 1884, Salem 1901; Smyth 1850, 1867, 1884, Holstein Mills 1901, Sugar Grove 1901; Tazewell 1850, 1867, 1884; Washington, Farris 1901; Wise, Pound 1867; Wythe 1884, Wytheville 1901, 1918.

WEST VIRGINIA.

Barbour 1901; Berkeley 1901; Boone 1901; Braxton 1901; Clay 1901; Fayette 1867, 1884, Deerwater 1901, Oak Hill 1884; Greenbrier 1867, 1884; Hamshire 1901; Hardy 1901; Harrison 1901; Jackson 1901; Jefferson 1901; Kanawha 1901; Logan 1901; Marshall 1901; Mason 1901; Mercer, Athens 1884, Elkins 1884, Oakvale 1884; Monongalia 1901; Monroe "and adjoining counties", 1833, 1850, Greenbrier 1884; Nickolas 1901; Pleasants 1901; Pocahontas 1901, Buckeye 1884; Preston 1884, 1901, Lewisbury 1884; Putnam 1901; Raleigh, Citie 1867, 1884, 1901, Prosperity 1884, Raleigh (C. H.) 1884, Roxie 1884, Sunflower 1884, Table Rock 1884; Randolph, Kingsville 1901; Roane 1901; Summers, Clayton 1884, Indian Mills 1884; Tucker 1901; Tyler 1901; Upshur 1901; Webster 1901; Wetzel 1901; Wood 1901; Wyoming 1901.

---

\* Recorded in U. S. D. A. Bur. Ent. B 71, 1923.











PERIODICAL CICADA  
KNOWN DISTRIBUTION OF BROOD XXI

○ RECORDED ONE YEAR IN THE COUNTY  
● " TWO YEARS "

Brood XXI of the tredecim race is very problematical. Three successive appearances were recorded in the extreme northwestern part of Florida, 1844, 1857, and 1870. There was a single record of the appearance of this brood in 1883 and 1896 in South Carolina and Louisiana, respectively. The brood was not recorded in 1909 and in 1922 only two specimens were seen, both at Pelahatchie, Miss. Following is a list of all the records available to the Insect Pest Survey on the occurrence of this brood:

Brood XXI. 1844, 1857, 1870, 1883 (1896), (1909), 1922.

ALABAMA.

Lauderdale\*; Mobile, Mobile 1870.

FLORIDA.

Northwestern part 1870; Gadsden 1844, 1857; Jackson 1844, 1857; Washington 1844, 1857.

LOUISIANA.

Livingston, Whitehall 1896.

MISSISSIPPI.

Eastern part 1870; Jackson\*; Tishomingo\*; Rankin, Pelahatchie 1922.

NORTH CAROLINA.

Davie 1870; Iredell 1870.

SOUTH CAROLINA.

Barnwell, Martin 1883.

TENNESSEE.

Hardin 1922, Savannah 1870.

---

\* Recorded in U. S. D. A. Bur. Ent. B. 71, 1923.





TABLE OF COINCIDENCE  
OF BROODS OF PERIODICAL CICADA

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII
XVIII			1776														
XIX				1777													
XX	1791				1778												
XXI		1792				1779											
XXII			1793				1780										
XXIII				1794				1781									
XXIV	1808				1795				1782								
XXV		1809				1796				1783							
XXVI			1810				1797				1784						
XXVII				1811				1798				1785					
XXVIII	1825				1812				1799				1786				
XXIX		1826				1813				1800				1787			
XXX			1827				1814				1801				1788		
XVIII				1828				1815				1802				1789	
XIX	1842				1829				1816				1803				1790
XX		1843				1830				1817				1804			
XXI			1844				1831				1818				1805		
XXII				1845				1832				1819				1806	
XXIII	1859				1846				1833				1820				1807
XXIV		1860				1847				1834				1821			
XXV			1861				1848				1835				1822		
XXVI				1862				1849				1836				1823	
XXVII	1876				1863				1850				1837				1824
XXVIII		1877				1864				1851				1838			
XXIX			1878				1865				1852				1839		
XXX				1879				1866				1853				1840	
XVIII	1893				1880				1867				1854				1841
XIX		1894				1881				1868				1855			
XX			1895				1882				1869				1856		
XXI				1896				1883				1870				1857	
XXII	1910				1897				1884				1871				1858
XXIII		1911				1898				1885				1872			
XXIV			1912				1899				1886				1873		
XXV				1913				1900				1887				1874	
XXVI	1927				1914				1901				1888				1875
XXVII		1928				1915				1902				1889			
XXVIII			1929				1916				1903				1890		
XXIX				1930				1917				1904				1891	
XXX	1944				1931				1918				1905				1892
XVIII		1945				1932				1919				1906			
XIX			1946				1933				1920				1907		
XX				1947				1934				1921				1908	
XXI	1961				1948				1935				1922				1909
XXII		1962				1949				1936				1923			
XXIII			1963				1950				1937				1924		
XXIV				1964				1951				1938				1925	
XXV					1965				1952				1939				1926
XXVI						1966				1953				1940			
XXVII							1967				1954				1941		
XXVIII								1968				1955				1942	
XXIX									1969				1956				1943
XXX										1970				1957			
XVIII											1971				1958		
XIX												1972				1959	
XX													1973				1960



# INSECT PEST SURVEY BULLETIN

Vol. 15

May 1, 1935

No. 3

## THE MORE IMPORTANT RECORDS FOR APRIL 1935

The lesser migratory grasshopper (Melanoplus mexicanus Sauss.) was hatching in large numbers in Arizona during the second week in April and was moving into alfalfa fields by the third week of the month. The clear-winged grasshopper started hatching in southern California during the second week in April.

Cutworms continued to be reported as serious pests throughout the South and northward to Delaware, Ohio, and Nebraska.

Flights of June beetles were observed during the third week in the month as far northward as Maryland, and the beetles were rather seriously damaging a variety of crops in Mississippi during the latter part of the month.

The chinch bug began scattering in hibernating quarters during the third week of the month, and by the last of the month flights were reported from Indiana, Illinois, Kansas, and Oklahoma.

During the last of March and the first week of April outbreaks of the green bug were reported from Georgia.

The hessian fly is reported as occurring in large numbers in northeastern Oklahoma on wheat sown early for grazing. A heavy infestation in volunteer wheat is also reported from Ohio.

The successful hibernation of the corn ear worm at Arlington Farm, near Washington, D. C., was reported during the month.

The clover leaf weevil was reported as injuriously abundant in Ohio, Kentucky, and Kansas.

An outbreak of the pea arhid in alfalfa in southern California was reported very late in March, and during April serious damage to peas was reported from the San Francisco Bay district of California, and indications of trouble from this insect were also reported from Nevada.



The codling moth began to emerge in numbers about the middle of April in Georgia. Pupation was well under way in Ohio, Illinois, Missouri, and Washington during the month.

During the first week in the month the plum curculio began to emerge from hibernation in Virginia and by the end of the month it was collected in considerable numbers. In South Carolina, Georgia, and Alabama the infestation is much heavier than it has been for several years.

More than half of the oriental fruit moth larvae had pupated by April 20 in Delaware, and adult moths were collected in the orchards on April 23 in southern Virginia. Twig injury was observed in the Fort Valley section of Georgia during the first week in April. Twig injury was also observed during the month in Mississippi.

Considerable damage by pear thrips was reported early in the month from Oregon and California.

This year the vegetable weevil was found in the coastal-plain area of South Carolina, where it had not been known to occur previously.

The Colorado potato beetle is apparently much more prevalent than usual in the Gulf and South Atlantic States, from Alabama to South Carolina.

The first adult of the Mexican bean beetle was observed on April 22 at Experiment, Ga. In the northern States (Delaware and Ohio) winter mortality was very heavy.

The pepper weevil is appearing in unprecedented numbers in parts of southern California.

The tobacco flea beetle is seriously affecting tobacco plant beds along the Atlantic seaboard from Florida to Maryland.

Heavy infestations by the forest tent caterpillar are expected in the northern New England States, and a very heavy infestation by this pest was reported from the Gulf coast counties of Mississippi during the month.

Reports of screw worm infestations of livestock are being received in increasing numbers from Georgia, Florida, and parts of Texas.

Termite damage is being reported from an unusual number of properties in the Northern States, extending from Long Island, N. Y., and Delaware westward to Nebraska.

## GENERAL FEEDERS

### GRASSHOPPERS (Acrididae)

Georgia. O. I. Snapp (April 9): Grasshoppers, mostly Schistocerca americana Drury, are moderately abundant on grass in pastures at Fort Valley.

Florida. F. L. Chamberlin (April 1): Rather heavy infestations of newly emerged grasshoppers have been observed attacking tobacco during the past few days in Gadsden County.

Arizona. C. D. Lebert (April 10-15): Tiny hoppers of Melanoplus mexicanus Sauss. were noticed by the thousands in fence rows and on ditch banks along an old field of oat stubble near Buckeye on April 10. By April 15 they had crossed the road to an alfalfa field.

California. S. Lockwood (April 25): The clear-winged grasshopper (Camnula bellucida Scudd.) started to hatch in large numbers along the coast of San Diego County on April 10 and in the mountainous area on April 17.

### CUTWORMS (Noctuidae)

Delaware. L. A. Stearns (April 10): Slight injury reported in connection with some 600,000 pepper plants under glass at Bridgeville.

South Carolina. W. C. Nettles (April 20): Cutworms are bad in tobacco seedbeds in eastern Carolina.

Georgia. O. I. Snapp (April 5): Cutworms are more abundant than usual and we have received many complaints of damage to gardens and annual flowers at Fort Valley. They have also cut down many little peach trees in our nursery.

Ohio. T. H. Parks (April 24): Complaints were received during the first part of April that a cutworm has been injuring tomato plants in greenhouses near Cleveland. It climbs the plants at night and cuts off the terminals.

Tennessee. G. M. Bentley (April 24): Noctuid moths are active and cutworms are moderately abundant.

Alabama. J. M. Robinson (April 20): Cutworms continue to be active and are attacking vegetables.

Mississippi. C. Lyle and assistants (April 23): Cutworms have been causing considerable damage to young vegetable plants in Jackson and Harrison Counties. The greasy cutworm (Agrotis ypsilon Fott.) was observed causing severe damage to tomatoes at Clarksdale.

Missouri. L. Haseman (April 26): A few moths of the greasy cutworm (A. ypsilon) were observed from April 20 to 22. Last night great swarms of the moths appeared on apple blossoms at Columbia.

Nebraska. M. H. Swank (April 20): A report received from Frontier County on April 15 stated that cutworms were taking the wheat in some spots. An abundance of pupae of the army cutworm (Chorizagrotis auxiliaris Grote), chiefly in old alfalfa and cornfields, was reported from Muckolls, Nebraska, Furnas, Hayes, and Gosper Counties from March 25 to April 5.

Kansas. H. R. Bryson (April 27): Cutworms were reported by E. G. Kelly on April 5 to be damaging alfalfa, sweetclover, and some wheat in Clay County, and moving from grasslands to wheat and alfalfa in Ottawa County. On a 50-mile drive, 12 alfalfa fields and 14 wheat fields visited in Republic County showed a population of from 1 to 8 cutworms per plant.

H. H. Walkden (March): Pupae of Scotogramma trifolii Rott., dug out of soil late in February at Manhattan, yielded adults on March 13. This species is ordinarily scarce in eastern Kansas, and the writer has never taken overwintering pupae previously. (April 19): Larvae of Feltia subopthica Haw. were sufficiently abundant in Jackson County to cause some injury to alfalfa in local areas.

Texas. K. P. Ewing (April 13): Cutworms have done considerable damage in places in Calhoun County. The greatest damage noted thus far was the destruction of approximately 300 acres of cotton, out of a block of 700 acres. The entire acreage was planted in pedigreed seed costing \$2 per bushel. On this one farm the loss was about \$750. On many small acreages, of 15 acres or less, this insect has destroyed the stand of cotton.

Utah. G. F. Knowlton (April 2): Cutworms are damaging range plants on Promontory Ridge, from 15 to 25 per square foot being found. They are also present in damaging numbers at Promontory and at Promontory Point, in Box Elder County. Euxoa (Chorizagrotis) sp. auxiliaris group are damaging dry-farm wheat at East Promontory. (Determined by C. Heinrich.)

#### ARMYWORM (Cirphis unipuncta Haw.)

Missouri. L. Haseman (April 26): The epidemic of armyworms, reported in March from southwestern Missouri, began emerging as moths in breeding cages about April 10, and between April 15 and 20 a few moths came to lights at Columbia. On April 22 swarms of moths appeared on fruit blooms at Mount Vernon, and on April 25 swarms appeared on apple blossoms at Columbia. The armyworm seems to have been thrown out of its normal cycle by last summer's drought, for we had an outbreak of worms in southern and central Missouri late last fall, and we have already a matured crop of them doing considerable damage in southern



Missouri. The swarms of moths appearing at Columbia recently may be migrants or they may have hibernated from unobserved early spring brood worms locally, as the moths in central Missouri last fall oviposited and the worms were partly developed before winter set in; however, no complaints of serious damage from the worms in the central part of the State this spring have been reported to us.

BEET WEEB WORM (Lonostegia sticticalis L.)

Kansas. H. H. Walkden (April): A heavy flight of adults occurred at Hays on April 22, approximately 6,000 specimens being taken at the trap light. These are, no doubt, adults of the fall generation, the larvae of which caused such widespread injury to Russian-thistle last fall.

MONARCH BUTTERFLY (Danais plexippus Hbn.)

Maryland. J. A. Hyslop (April 30): The first adult of this year was observed flying about a lilac hedge on my farm at Avenel.

WHITE GRUBS (Phyllophaga spp.)

Pennsylvania. H. E. Hodgkiss (April 22): White grubs were reported abundant in newly plowed ground in Bedford County on April 15.

Maryland. J. A. Hyslop (April 27): The first adults of the season were collected on my farm at Avenel. The night was warm and cloudy, followed by rain. In Silver Spring the flight was so heavy as to interfere with a motion picture performance.

South Carolina. W. C. Nettles (April 20): White grubs attacking lawns have been observed several times.

Minnesota. A. A. Granovsky (April 22): White grubs are still quite deep in the soil, ranging from 16 to 26 inches below the surface, according to our last digging, made April 10. The adults are close to the surface, usually within 2 or 3 inches of it. From the information on hand, we expect a rather heavy flight of brood A June beetles and moderately severe injury from white grubs of brood C. Brood B is very unimportant economically in most sections of the State.

Iowa. H. E. Jaques (April 23): We are beginning to find a goodly number of May beetles.

Kansas. H. R. Bryson (April 23): Adults have been slow in coming to lights, owing to the low night temperatures. White grubs are less abundant in the soil than usual.

Oklahoma. F. A. Fenton (April 23): The first early May beetle was observed March 26. Most of the specimens have been identified as P. calceata Lec.

D. Nixon (March 26): One male of P. crassissima Blanch. and 38 males and 4 females of P. cricenta were collected at a trap light at Stillwater today.

Mississippi. C. Lyle and assistants (April 23): Pecans, roses, and other plants in all sections of the State have been more or less injured by May beetles during the past month. One large batch of specimens received from Yazoo County represented two species--P. congrua Lec. and P. crenulata Froel. On April 23 A. L. Hamner collected at lights at State College 45 specimens of P. calceata Lec., 10 males of P. fraterna var. mississippiensis Davis, 4 males of P. tristis Fab., and 1 male of P. bipartita Horn.

E. W. Dunnam (April 26): It has been noted that May beetles appeared scarce in the vicinity of Leland, an hour's search around strong lights yielding only a dozen beetles.

Texas. E. W. Laake (April 22): It has been reported to this office that 50 percent of the red oak, 50 percent of the post oak, 10 percent of the blackjack oak, 20 percent of the elm, and 20 percent of the sweetgum in Gregg, Rusk, Harrison, Panola, and Usher Counties, have been partly or wholly defoliated by May beetles.

#### GREEN JUNE BEETLE (Cotinis nitida L.)

South Carolina. W. C. Nettles (April 20): Green June beetle larvae are reported as abundant in tobacco seedbeds in the eastern part of the State.

Illinois. C. L. Metcalf (April 1): We have a report of the green June beetle occurring by the thousands in gardens and lawns in West Frankfort, Franklin County.

Alabama. J. M. Robinson (April 20): Strawberries at Auburn are being attacked by larvae of the green June bug.

#### WIREWORMS (Elateridae)

Kentucky. W. A. Price (April 26): Undetermined species of wireworms have been received from several places in the State during the past few days.

Alabama. J. M. Robinson (April 20): At Auburn strawberries are being attacked by wireworms.

California. S. Lockwood (April 19): Considerable damage to buds of prune trees has occurred along the Consumnes River in Sacramento County. The insects collected from the buds were as follows: Click beetles, Pheletes canus Lec. and Cardiophorus stigmaticus Cand., and the chrysomelid Lema nigrovittata Guer.

M. W. Stone (April 20): An 18-acre field of young sugar beets at Wintersburg was so severely damaged by the sugar beet wireworm (P. californicus Mann.) that it was necessary to replant the entire area.

#### A CHINCH BUG (Blissus hirtus Montd.)

Ohio. J. S. Houser (April 22): The hairy chinch bug (B. hirtus) has hibernated successfully in lawns in Cleveland and bids fair to continue this season as a destructive lawn pest.

### CEREAL AND FORAGE - CROP INSECTS

#### WHEAT AND OTHER SMALL GRAINS

##### HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (April 24): Volunteer wheat in a 200-acre field in Madison County is heavily infested. Last year much of the grain was shattered in the harvesting process. The adults have not emerged. The entire field is being plowed under to protect uninfested wheat.

Oklahoma. C. F. Stiles (April 24): Several reports have been received during the past few days from county agents from the northeastern part of Oklahoma, stating that the hessian fly is present in large numbers. The wheat was sown early last fall for grazing. Farmers are planning to harvest the grain, should any be produced.

##### CHINCH BUG (Blissus leucopterus Say)

Ohio. T. H. Parks (April 24): A survey of six western Ohio counties early in April shows far more than the usual numbers of overwintering chinch bugs present in clumps of timothy. Seneca, Hancock, and Wyandot Counties average between 60 and 75 bugs per square foot area. Bluegrass harbors very few bugs, but many are found on the floor of woods. Winter mortality has been from 12 to 14 percent.

Indiana. C. M. Packard (April 27): Considerable chinch bug flight from hibernation quarters to small grain fields has occurred during the past few days at La Fayette.

Illinois. W. P. Flint (April 23): There has been no general movement of chinch bugs from hibernating quarters into the small grains. The bugs have scattered considerably in the hibernating quarters, but no change of any significance has occurred. From 14 to 16 percent of the bugs died during the winter, which is higher than usual. (April 30): A general movement out of winter quarters started on April 23, continuing to the present time, with a strong movement on the 28th. From 65 to 75 percent of the bugs have now left winter quarters, 50 percent having settled in small grains.



Iowa. C. J. Drake (April 27): Very few chinch bugs have been observed in flight in southern Iowa. The bugs are quite active and can be found crawling around in their hibernating quarters or in grassy areas near favorable hibernating situations. On the whole, the population is much higher than it was last year. About 80 counties are infested.

E. F. Jaques (April 27): Chinch bugs have come through the winter in large numbers.

Missouri. L. Haseman (April 22): No considerable numbers of chinch bugs have left winter quarters in central Missouri.

Kansas. E. R. Bryson (April 20): Chinch bugs are to be found in small-grain fields but are not as plentiful as last year. Reports from Republic, Neosho, Crawford, and other counties indicate a much lighter population than last year.

W. T. Emery (March): A late February survey to determine abundance revealed a decrease in population in northeastern Kansas, from an average of 45 to 10 bugs per square-foot sample. However, in southeastern Kansas the population remained stationary. On March 14, 17 sorghum stubbles contained 44 chinch bugs, or an average of 2.6 each, while 24 kafir stubbles showed 12 bugs, or an average of 0.5 each. On March 25, 6 adults were caught on flight screens set up at Manhattan.

Oklahoma. F. A. Fenton (April 23): Unusually warm weather on March 25 caused an early emergence from hibernation and flight to small grains. At Lawton this movement seems to have been complete, whereas at Stillwater there were still a few bugs in hibernation until the middle of April.

C. F. Stiles (April 24): Chinch bugs are not showing up in very large numbers in northeastern Oklahoma. However, we are expecting a severe outbreak should weather conditions be favorable in the next 2 months.

#### GREEN BUG (Toxoptera graminum Rond.)

Georgia. T. L. Bissell (April 1): An oat field at Experiment has been badly damaged by aphids. Several patches from 15 to 40 feet across were killed. There are now very few living lice. Many aphids are parasitized. Coccinellid larvae are moving on ground for lack of food. Few aphids on adjoining wheat field, but no plants were killed. I have heard of two similar outbreaks in the vicinity, both on fall-sown oats.

#### CORN

#### CORN EAR WORM (Heliothis obsoleta Fab.)

Virginia. F. F. Dicke (March): An area of approximately 200 square yards

at the Arlington Farm devoted to late sweet corn was examined late in March to determine to what extent the corn ear worm had survived the winter. This area yielded a total of 74 pounds, 60 of which, or 76 percent, were living. Since considerable mortality occurs normally in the early pupal stage, it is evident that the mortality during the winter was unusually low. There was no significant difference between the depths at which the living and dead worms were found. Although below-zero temperatures occurred the ground was well protected by snow from frost penetration.

Louisiana. W. E. Hinds (April 27): Eggs are abundant in many fields of early corn and also on tomatoes.

Texas. F. L. Thomas (March 23): First adults were observed on March 7 at Dickinson by J. W. Fonev. First adults emerged at College Station on March 23.

#### SALT-MARSH CATERPILLAR (Estigmene gorae Drury)

Florida. J. R. Watson (April 23): The salt-marsh caterpillar has been very destructive to corn during the past month, particularly in Alachua and adjoining counties.

Texas. J. W. Roney (March 26): Many second-instar and third-instar larvae of the salt-marsh caterpillar were found on turnips, corn, cabbage, and beets.

#### SOUTHERN CORN ROOT WORM (Diabrotica duodecimpunctata Fab.)

South Carolina. F. Sherman (April 20): Damage by the southern corn root worm reported, chiefly from eastern South Carolina.

Louisiana. C. E. Smith and P. K. Harrison (April): Injury to corn at Baton Rouge was first noticed March 30. On April 1 corn growing on the experimental plots at Louisiana State University was being injured by the larvae. On April 7 the first spring-brood beetles, apparently several days old, were observed in the field.

#### CORN BILLBUGS (Calendra spp.)

South Carolina. W. C. Nettles (April 20): Some complaint of damage by billbugs reported from eastern South Carolina.

Florida. J. R. Watson (April 23): Billbugs were sent in from Clay County where they were reported to be doing serious injury to corn.

#### CLOVER

#### CLOVER LEAF WEEVIL (Hypera punctata Fab.)

Ohio. T. H. Parks (April 24): I was called to see a severely injured

alfalfa field in Franklin County on April 1. Injury still continues. Such outbreaks in Ohio are usually spotted and very local.

Kentucky. W. A. Price (April 26): The clover leaf weevil is very abundant over the State. Many specimens have been received from the vicinities of Maysville, Shelbyville, Glasgow, Elizabethtown, and Lexington.

Kansas. H. R. Bryson (April 15): The clover leaf weevil is abundant in some alfalfa fields in Franklin County and is doing some injury to leaf buds.

#### COMMON RED SPIDER (Tetranychus telarius L.)

Louisiana. H. A. Jaynes (March 28): A large amount of clover in Houma is infested by a red spider, evidently T. telarius. One field of vetch was very heavily infested.

#### ALFALFA

#### ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (April 20): In the San Joaquin Valley the alfalfa weevil is somewhat more abundant than a year ago. In one field at Vernalis on April 19 an average of 1,672 larvae were taken per 100 sweeps of an insect net. Some damage has been done in this field. On April 10 the average number of larvae collected per 100 sweeps was 1,000. The next highest average larval count was 676. In other infested fields in the San Joaquin Valley the counts have been low, in many fields below 100. Apparently the weevil will not be of any economic importance. In the Pleasanton area the highest average larval count up to April 12 was 357 per 100 sweeps. Counts much higher can be expected later on, as owing to a great deal of cold weather, there are a number of fields where the first crop of alfalfa is only about half grown. In the Niles area the highest count on April 12 was slightly less than 1,000 larvae per 100 sweeps. In this area all fields are ready to be harvested.

#### PEA APHID (Illinoia pisi Kelt.)

Kansas. H. R. Bryson (April 15): Very few pea aphids are to be found in the State. In no instance do they occur in sufficient numbers to cause damage. Aphids have been found in alfalfa fields in Franklin, Riley, Clay, and Republic Counties. None were found in Neosho and Crawford Counties.

E. T. Jones (April 20): Fourteen alfalfa fields in six eastern counties examined during the third week in April averaged 182 aphids per 100 sweeps. Similar sweepings made on March 17 yielded no infestation. An unusually large number of the usual insect predators of aphids were found in all fields.



Arizona. T. P. Cassidy (April 27): Reports were received during the past week from Sacaton and the Salt River Valley that plant lice were causing serious damage to alfalfa. Inspections made in several alfalfa fields in the Salt River Valley showed the infestation to be very heavy, as literally thousands of plant lice could be collected in a net by sweeping the plants a few times.

Nevada. R. A. Blanchard (March): Periodic observations in western Nevada indicate the possibility of an outbreak of the pea aphid. The relatively mild and early spring weather has allowed viviparous forms to survive in small numbers. During normal years winter temperatures are low enough to destroy green growth, preventing the aphids from passing the winter in any but the egg stage. The fields in the vicinity of Reno had green growth from 1/2 inch to 2 inches tall on March 28, and examination in six fields showed populations ranging from 4 to approximately 300 aphids per five-clump sample.

Oregon. L. P. Rockwood (April 10): This species averaged 59 aphids per 100 sweeps in a field of alfalfa on high ground, showing good spring growth at New Era. Many were quite small and there were no alates. (April 13): In the Willamette Valley early fall-sown vetch, seeded in August or September, as cover crops, showed moderate infestations, as many as 350 aphids per 100 sweeps in some cases. Vetch fields, for hay or seed, seeded in October showed very few or no aphids. Two alates were swept from August-sown vetch, but none from October vetch. Coccinellid beetles, particularly Hippodamia convergens Guer., are becoming abundant in vetch fields. H. quinquesignata obliqua Csy. and H. sinuata spuria Lec. began leaving their hibernation cache on April 11 and are increasing in vetch fields.

California. R. A. Blanchard (March): An outbreak on alfalfa appears probable in the Antelope Valley of southern California. The severity of this will depend upon weather conditions during the early part of April. The populations are building up later than usual. There seems to be some correlation between this condition and the fact that very few severe frosts occurred during the early spring to prune back the alfalfa growth. The average temperature, however, has been sufficiently low to allow only slow growth of the plants. Such slow steady growth has been observed previously to result in slow accumulation of aphids, whereas periods of higher temperatures interspersed with frosts have resulted in early infestations. The late infestations have been observed to affect the alfalfa more adversely and cause a larger total loss of hay than did infestations that occurred before the alfalfa had begun to make sustained growth.

#### SUGARCANE

##### SUGARCANE BORER (Diatraea saccharalis Fab.)

Louisiana. W. E. Hinds (April 27): Moths began emerging from overwintered larvae, in some numbers, following the rising of mean temperatures to

about 70° F., about the first week of April. Eggs from these moths hatched and first-stage and second-stage larvae were causing characteristic perforations in leaves of corn and cane by the third week of April. The most advanced larval stage that could be found in the southern part of the cane belt up to April 24 was the fourth, most of the larvae in corn then being in the second and third stages, while those in cane were in the first and second stages. Mortality among young larvae has been very high in cane, especially throughout April. Apparently the numbers developing in the first generation will be less than usual. Trichogramma minutum Riley has not been taken in cane borer eggs this season, but has been bred from eggs of Heliothis obsoleta Fab. The first parasitized egg was collected on April 5 at Baton Rouge, and from it three parasites emerged on April 15. Another egg, collected on April 12, produced three parasites on April 23.

#### SUGARCANE BEETLE (Euetheola rugiceps Lec.)

Louisiana. W. E. Hinds (April 27): Adults were in flight in some numbers at Baton Rouge on the night of April 5, following a cloudy day with maximum temperature at 80° F., with still air in the evening. The temperature ranged from 73° at 6 p.m. to 70° at midnight.

### F R U I T I N S E C T S

#### APPLE

#### CODLING MOTH (Carpocapsa pomonella L.) . . .

Delaware. L. A. Stearns (April): Four percent of overwintered larvae pupated on April 20; 22 percent mortality for cage material.

Georgia. C. H. Alden (April 20): Adults were emerging in large numbers from insectary bands on April 19 and were also being caught from bait traps in orchards. The first adult was caught on April 1 at Cornelia.

Ohio. T. H. Parks (April 24): Larvae are very abundant under loose bark of tree trunks in the worst infested orchards. Few have been killed by birds this winter. Pupation has started, and we look for a heavy emergence from overwintered larvae.

Illinois. W. P. Flint (April 23): The codling moth has pupated generally throughout the southern part of the State. No emergence is expected before about the first of May.

Minnesota. A. G. Ruggles (April 22): Many codling moth larvae killed during the winter around Minnetonka district and University Farm at Saint Paul.



Missouri. L. Haseman (April 22): Over 50 percent pupation in southeastern Missouri by April 15, less in the southwestern part, and about 2 percent at Columbia to date. No moths are out.

Washington. E. J. Newcomer (April 22): In the Yakima Valley larvae have been pupating for some time and adults will probably begin emerging about May 10. This is about 4 weeks later than last year. Fruit trees are blooming about that much later this season.

EASTERN TENT CATERPILLAR (*Malacosoma americana* Fab.)

New Hampshire. L. C. Glover (April 23): On April 21 egg masses of the eastern tent caterpillar were hatching.

Vermont. H. L. Bailey (April 25): Egg masses are from scarce to moderately abundant in the vicinity of Burlington. A very few have hatched, but are still clinging to egg masses. They are more plentiful in the southern half of the State.

Massachusetts. J. V. Schaffner, Jr. (April 19): One hundred and five egg clusters of the eastern tent caterpillar were examined for hatching at Melrose on April 19, and of these two clusters each had one larva freshly emerged. Egg clusters are abundant in the vicinity.

Connecticut. E. P. Felt (April 23): At Stamford, eggs of the apple tree tent caterpillar have hatched in considerable numbers, with every indication that there will be an extraordinary abundance of the pests.

M. P. Zappe (April 22): In New Haven County eggs have hatched and young larvae are feeding on opening buds of apple, peach, and wild cherry.

New York. N. Y. State Coll. Agr. News Letter (April): Tent caterpillars are reported as abundant on Long Island and in the Hudson River Valley. Hatching was observed early in the month throughout this region.

Delaware. L. A. Stearns (April): In Newark the first hatching occurred on April 1. Nests were first generally visible on April 17.

Pennsylvania. T. L. Guyton (April 23): The eastern tent caterpillar hatched the first and second week of April and now forms conspicuous tents on favored plants in Cumberland, Perry, Juniata, Lancaster, and Dauphin Counties. It is probably present in most of the counties in the eastern half of the State.

H. N. Worthley (April 22): Eastern tent caterpillar eggs hatched during warm weather from April 19 to 21 at State College. Nests are just becoming visible in the crotches of unsprayed apple trees.

Maryland. E. N. Cory (March 26): The eastern tent caterpillar has begun to emerge at College Park.



Georgia. O. I. Sharp (April 13): This insect is considerably more abundant at Fort Valley this year than usual. Perhaps the heaviest infestation ever observed in a peach orchard was recorded on March 25. Eggs were hatching the middle of March and practically full-grown larvae were observed on April 13.

W. F. Turner (April 3): I noticed what seemed to be a particular abundance of tent caterpillar tents on wild cherry and wild crab apple in Bibb, Jones, and Baldwin Counties.

Tennessee. G. M. Bentley (April 24): Very abundant. I have never seen as many on wild cherries and unsprayed apple trees.

Kansas. H. R. Bryson (April 27): On April 16, many wild plum and cherry trees were infested with small tents in Crawford and Neosho Counties.

RIBBED COCOON MAKER (Bucculatrix pomifoliella Clem.)

New Hampshire. L. C. Glover (April 23): This insect was reported as rather common on apple trees in Rockingham County.

APPLE APHIDS (Aphididae)

Vermont. H. L. Bailey (April 25): Eggs of the green apple aphid (Aphis pomi DeG.) are generally scarce, in Grand Isle and Chittenden Counties. An occasional tree with many water sprouts found heavily infested. No eggs hatched.

Connecticut. P. Garman (April 22): Apple aphids, A. pomi, are generally scarce at the present time in New Haven County. Unfavorable weather doubtless reduced the population. No rosy aphid (Anuraphis roseus Baker) observed to date.

M. P. Zappe (April 22): Eggs of the green apple aphid have been hatching for several days and aphids are present on buds in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (April): Apple grain aphids (Rhopalosiphum prunifoliae Fitch) began hatching during the last week in March and the first week in April. Rosy apple aphids were seen hatching in Ulster County during the first week of the month and were reported from other counties in the Hudson River Valley later in the month. Toward the end of the month A. pomi was appearing in about normal numbers. In western New York the three species were found in considerable numbers by the last week in April, indicating that hatching is almost completed.

Pennsylvania. H. E. Hodgkiss (April 22): Rosy apple aphid eggs hatched in Washington and Allegheny Counties on March 28, in Franklin County on March 29, and in Adams County on March 30. Green apple aphid eggs were hatching in fairly good numbers on these dates with many in the second

instar. Apple grain aphid eggs hatched along with the green aphid, with many in the third instar when the early apple buds opened. The general condition up to April 13 was, for rosy aphids, generally spotted; for green and grain aphids, plentiful but not as many as in most years. The exact situation as regards the extent of rosy aphid infestation could be determined by April 19.

H. N. Worthley (April 22): At State College, apple aphids were moderately abundant on apple. On April 15, observations showed 6.6 aphids per bud (200 buds); on April 18, 4.2 aphids per bud (200 buds). Temperature went to 19° F. on April 16 and the cold weather killed 36 percent of the aphids. The apple buds are now nearly in the pre-pink stage and of the aphids present, 93 percent are green aphids and 7 percent grain aphids. No rosy aphids have been seen to date.

Delaware. L. A. Stearns (April): Eggs of the grain aphid have hatched and were generally abundant on apple on April 2.

Virginia. W. J. Schoene (April 24): Eggs of apple aphids hatched at Winchester as follows: Grain aphid on March 17, apple aphid on March 20, rosy aphid on March 23. No injury has been reported except in small unsprayed orchards.

Ohio. W. H. Parks (April 24): Stem mothers of the apple grain aphid are now giving birth to second-generation young at Columbus. The freeze of April 16 apparently killed very few aphids, although the temperature descended to 22° F. Apple trees are approaching the full-pink stage.

Missouri. L. Haseman (April 23): In the early part of the month some apple grain aphids were observed on buds in central Missouri, but by the last of the month only a few had appeared.

Mississippi. C. Lyle and assistants (April 23): The apple aphid was reported as moderately abundant in the vicinity of Wiggins. Some colonies were being heavily parasitized.

Oregon. D. C. Mote (April 13): Rosy aphids were reported by B. G. Thompson on apple at Monroe.

#### SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Delaware. L. A. Stearns (April 3): Some infestation of 2-year-old apple trees in Bridgeville; three trees dead.

Georgia. O. I. Snapp (April 3): Larvae of the twice-stabbed ladybeetle (Chilocorus biwulnerus Muls.) preying on the scale, are unusually abundant at Fort Valley. J. B. Thomson reports as many as 60 larvae on a scale-infested peach twig 12 inches long and 1 inch in diameter, the largest population of this predacious insect he has ever observed in a single peach tree.

Tennessee. G. M. Bentley (April 2<sup>1</sup>): The San Jose scale is moderately abundant.

Alabama. J. M. Robinson (April 20): The San Jose scale is moderately abundant on peaches and apples.

FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (April 20): The flat-headed apple tree borer was reported working in either apple or walnut trees in Furnas, Saunders, Butler, Douglas, and Custer Counties from April 2 to 12.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Vermont. H. L. Bailey (April 25): Eggs of the European red mite are from scarce to moderately abundant, with a high percentage of apparent winter kill, in Grand Isle County.

Pennsylvania. H. E. Hodgkiss (April 22): The European red mite egg infestation is rather general through the State. Infestations in individual orchards are not heavy.

PEACH

PLUM CURCULIO (Conotrachelus nemuphar Hbst.)

Delaware. L. A. Stearns (April 24): No emergence of curculio from hibernation as yet.

Virginia. W. J. Schoene (March 24): Two plum curculios were taken at Crozet on April 5. No more were collected until April 23, when considerable numbers were taken.

South Carolina. F. Sherman (April 20): The plum curculio is worse than usual.

Georgia. O. I. Sharp (April 2): Large numbers of adults appeared from hibernation during the last four days in Fort Valley. A total of 736 curculios were jarred from 16<sup>1</sup>/<sub>2</sub> peach trees this morning, which is an average of 4.5 beetles per tree. An average of 9 beetles per tree were jarred from trees in several sections of the orchard. This indicates that the infestation is very much heavier than for several years. Weather conditions have been favorable during the last week to bring the curculios out of hibernation. An average of 1.05 beetles per tree were jarred from the trees on March 29 and, as the average caught this morning was 4.5 beetles per tree, the arrival in the orchards between those dates was very heavy. (April 3): Eggs nearly ready to hatch were found in little peaches today. Oviposition began fully 2 weeks earlier than last year. Adults are so abundant that it is easy to find them on the trees and on the ground under the trees.



(April 18): The first larvae of the season were found in green peaches on April 6. They were 3 or 4 days old. Eggs began to hatch 3 weeks earlier than last year. Larvae began to leave peach drops this year on April 14, which is 3 weeks earlier than last year (May 7). There is every prospect of a serious second brood this season.

C. H. Alden (April 20): First adults were caught on March 23 at Cornelia. On March 27, 103 beetles were caught from six peach trees, the highest number ever recorded from this district. Cold weather has delayed egg deposition, however, and to date only a few egg punctures have been noted.

Illinois. W. P. Flint (April 23): The plum curculio is very scarce, judging from jarring records made by C. S. Chandler in southern Illinois.

Missouri. L. Haseman (April 22): Have taken no curculios at Columbia, and in the southern part of the State, where peaches are cracking their collars, none have been observed.

Alabama. J. M. Robinson (April 20): The peach curculio is more abundant than usual in central Alabama.

#### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (April): Sixty-five percent of overwintered larvae pupated April 20; 46 percent mortality for cage material.

Virginia. W. J. Schoene (April 24): Adult peach moths were taken in numbers in bait-pails in orchards near Roanoke and Crozet on April 23.

Georgia. O. I. Snapp (April 3): The first twig injury of the season was observed today at Fort Valley. The larvae in the twigs were about 4 days old. The eggs began to hatch on March 30, which is earlier than usual and, as a result, the maximum number of generations (six and partial seventh) is expected this year. The dates of first twig injury other years are as follows: April 10, 1925; April 20, 1926; April 1, 1927; April 25, 1928; April 4, 1929; April 29, 1930; April 22, 1931; May 17, 1932; April 20, 1933, and April 24, 1934.

C. H. Alden (April 20): The first adult was caught in the bait traps at Cornelia on April 8. No twig injury has been noted to date.

Mississippi. C. Lyle (April 23): Correspondents at Mount Olive and New Albany recently sent to this office peach twigs which had evidently been injured by larvae of this species, stating that the damage was quite noticeable. Considerable injury to peach trees has also been recently observed at State College.

#### PEACH BORER (Aegeria exitiosa Say)

Georgia. O. I. Snapp (April 20): Growth of peach borer larvae in Fort

Valley was resumed in peach trees during the last 5 weeks because of feeding, owing to warmer weather. There has been no ruption to date under orchard conditions.

LESSER PEACH BORER (Aegeria pictipes G. & R.)

Georgia. O. I. Shann (March 29): Moths of the spring brood are now on wing in Fort Valley. As usual, the infestation is heavy in neglected orchards and those in which there are trees with injured areas.

Ohio. T. H. Parks (April 2): Injury is very severe in a large commercial peach orchard near Columbus. Control is in progress this week.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. P. Garman (April 22): The pear psylla first appeared in New Haven County in numbers on the trees on April 19. Egg deposition started almost immediately.

New York. N. Y. State Coll. Agr. News Letter (April): The first pear psyllas to be observed were seen on March 6 in Orange County. Flies were generally abundant in the Hudson River Valley during the last week in March and the first week in April, with about normal egg laying. During the second week of April egg laying was very general over the Hudson River Valley, and during the third week similar reports were received from western New York.

PEAR THRIPS (Taeniothrips inconsequens Uzel.)

New York. N. Y. State Coll. Agr. News Letter (April): The first pear thrips of the season were observed on April 5 in Ulster County. They seemed to be generally scarce over the eastern part of the State.

Oregon. S. C. Jones (April): Adults are blasting pear buds in Willamette Valley, doing serious damage. Emerged March 14; oviposition April 6.

California. S. Lockwood (April 6): Pear thrips are doing considerable damage to opening pear buds in a small orchard in Scott's Valley in Lake County. This is the second year that this insect has been known to exist in Lake County.

CHERRY

BLACK CHERRY APHID (Myzus cerasi Fab.)

New York. N. Y. State Coll. Agr. News Letter (April): Eggs began hatching during the first week of the month in the Hudson River Valley and also in the Lake area. This aphid seems to be scarce.

PLUM

A SAWFLY (Hoblocampa cookei Clarke)

California. S. Lockwood (April 23): On April 17, larvae of this sawfly were found doing considerable damage to young plums near Winters, in Yolo County.

GRAPE

GRAPE LEAFHOPPER (Erythronema comes Say)

Minnesota. A. A. Granovsky (April 22): The grape leafhoppers overwintered in large numbers and are readily found in vineyards and gardens in proximity of wild or cultivated hosts.

GRAPE SCALE (Aspidiotus uvae Comst.)

Kentucky. W. A. Price (April 26): The grape scale is found commonly on grape vines and has increased rapidly during the past 2 years.

PECAN

PECAN CARPENTER WORM (Cossula magnifica Stkr.)

South Carolina. F. Sherman (April 20): We have received several reports of damage to pecan.

FILBERT

FILBERT BUD MITE (Eriophyes avellanae Nal.)

Connecticut. E. P. Felt (April 23): The filbert mite continues to be abundant in a planting at North Stamford, blasting possibly 25 percent of the buds.

CITRUS

CITRUS WHITEFLY (Dialeurodes citri Riley & Howard)

Florida. W. W. Yothers and M. R. Osburn (March): Observations on citrus insects were made following the freeze of December 12 and 13, when the temperature fell to 22° F. Living pupae of the whitefly were found in large numbers, both on the trees and on the ground, indicating that the direct effect of the freeze amounted to very little, except to deprive the insects of their normal food supply by defoliation.

FLORIDA RED SCALE (Chrysomphalus aonidium L.)

Florida. W. W. Yothers and M. R. Osburn (March): About 30 percent of the adult females of the red scale on grapefruit were still living, whereas



only 5.6 percent were living on grapefruit foliage. This agrees with similar observations made following the freeze of 1917, when 6 percent survived on camphor foliage.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Florida. W. W. Yothers and M. F. Osburn (March): The purple scale appeared to be more resistant than the red scale, the survival of adult females being about 72 percent in the same situations where the observations on red scale were made. Generally, all immature stages of both species of scale were frozen.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (January to April 23): Thirty-seven small infestations found in the Phoenix area have apparently been eradicated.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Arizona. C. D. Lebert (April): The cottony-cushion scale is occurring on several citrus plantings in the Phoenix area. Numerous complaints have been received. The seriousness of this pest is entirely offset by the timely appearance of many of the Australian ladybird beetles (Rodolia cardinalis Muls.). These predators are apparently living up to their reputations as outstanding examples of biological control.

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (April 23): The citrus aphid has increased very rapidly and is now very abundant on young growth of citrus. In most cases this is too late to do serious damage to trees or the coming crop.

Mississippi. C. Lyle and assistants (April 2): This aphid is very abundant on spirea at Coldwater.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. W. W. Yothers and M. R. Osburn (March): Observations following the freeze of December 12 and 13, when the temperature dropped to 22° F., show that the low temperatures apparently did not reduce greatly the number of rust mites.

AVOCADO

CITRUS ROOT WEEVIL (Pachnaeus litus Germ.)

Florida. J. W. Watson (April 23): Avocado bloom in the vicinity of Miami was attacked by the citrus root weevil and also by Anomala sp.

PAPAYA

PAPAYA FRUIT FLY (Toxotrypana curvicauda Gerst.)

Florida. W. W. Yothers and M. R. Osburn (March): Although the freeze killed to the ground line all papaya plants in central Florida, an examination of injured fruits revealed a number of living larvae of the papaya fruit fly. There was also considerable evidence that several fruits had been infested with larvae, which had left the fruit and gone into the ground to pupate since the cold wave.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Gyll.)

South Carolina. W. J. Reid and C. O. Bare (January 19 to February 12): Two vegetable growers at Charleston brought to our attention infestations of this insect feeding on carrot foliage. In one field carrot tops were damaged from 5 to 10 percent over an area of approximately 2 acres. The larvae also were found feeding on turnips in an adjoining field. This is the first record of the occurrence of this insect in the coastal-plain area of South Carolina. (Det. by L. L. Buchanan.)

Florida. J. R. Watson (April 23): The vegetable weevil was sent in from River Junction, Gadsden County, where it was reported to be seriously damaging tomatoes.

Alabama. J. M. Robinson (April 20): The vegetable weevil has been abundant on turnips during the winter and the adults are attacking the tomato plants, carrots, and cabbage over the southern two-thirds of the State.

Mississippi. C. Lyle and assistants (April 23): Injury to tomatoes and other vegetables in Copiah and Lincoln Counties has been reported. A correspondent at Hendenhall sent specimens to this office, stating that they were eating her tomato plants.

CUCUMBER BEETLES (Diabrotica spp.)

Tennessee. G. M. Bentley (April 21): The spotted cucumber beetle (D. duodecimpunctata Fab.) and the striped cucumber beetle (D. vittata Fab.) are moderately abundant.

Alabama. J. M. Robinson (April 20): The twelve-spotted cucumber beetle is moderately abundant at Auburn.

Mississippi. C. Lyle and assistants (April 23): Damage to vegetables by cucumber beetles was observed in Copiah and Lincoln Counties and to roses in Hinds County. The larvae of these beetles are causing very severe damage to tomato, cucumber, and watermelon plants in Stone, Forrest, and Jones Counties, one-third of the stand being destroyed in some fields.

Louisiana. C. E. Smith and P. K. Harrison (April 1): On the experimental plots at Baton Rouge, larvae of the spotted cucumber beetle were observed feeding on leaves of cabbage that had been covered with soil during cultivation.

Oregon. B. G. Thompson (April 13): Adults of the western spotted cucumber beetle (D. soror Lec.) were beginning to fly at Corvallis.

#### FLEA BEETLES (Halticinae)

Mississippi. C. Lyle and assistants (April 23): Flea beetles were causing quite a bit of damage to turnips at Moss Point. Heavy damage to tomatoe evidently caused by flea beetles, at Crystal Springs was reported.

#### A FLOWER THRIPS (Frankliniella cephalica Cwfd.)

Florida. J. R. Watson (April 23): Florida flower thrips has been increasing rapidly during the month, owing to the hot, dry weather. It has been very abundant on late bloom of citrus, but was too late to do much damage. It was quite injurious to beans in Alachua and Marion Counties, first attacking the leaves, but largely migrating to the blossoms when they appeared with the resultant shortening of the crop. They also destroyed the blooms and shortened the tomato crop in Marion and Hardee Counties.

#### ONION THRIPS (Thrips tabaci Lind.)

Florida. J. R. Watson (April 23): The onion thrips has been very destructive to celery and beans in the Sarasota and Belle Glade sections. In the latter section they started on English peas, from which they spread to beans, doing very decided damage.

#### POTATO AND TOMATO

##### COLORADO POTATO BEETLE (Lepidotarsa decemlineata Say)

New York. N. Y. State Coll. Agr. News Letter (April 15): H. H. Campbell, Nassau County, observed Colorado potato beetles emerging from soil on April 11.

South Carolina. W. C. Nettles (April 20): Potato beetles are more numerous than usual in the eastern trucking area.

Florida. J. R. Watson (April 23): The Colorado potato beetle was brought in from the southern part of Alachua County.

Tennessee. G. M. Bentley (April 24): The Colorado potato beetle is moderately abundant.

Alabama. J. M. Robinson (April 20): Moderately abundant.



O. T. Deen (April 10): The Colorado potato beetle was feeding more seriously in Baldwin County this year than for several years past. Most of the farmers have dusted or sprayed at least twice.

Mississippi. C. Lyle and assistants (April 23): Colorado potato beetles are now generally present in practically all parts of the State.

TOMATO PINWORM (*Gnorimoschema lyopersicella* Busck)

Delaware. L. A. Stearns (April 11): The single infestation in the State, in a greenhouse near Wilmington, has been eradicated by rotation of crops.

California. J. C. Elmore (March): Infestations by the tomato pinworm were observed as early as the middle of March in the early fields of tomatoes of the upland tomato-growing areas of Orange and San Diego Counties. (April 5): At San Juan Capistrano 21 plants were examined and 7 were infested. There were from one to three larvae per plant, a heavy infestation for this date.

BEET ARMYWORM (*Laphygma exigua* Hbn.)

California. J. C. Elmore (April 5): About half of the tomato plants examined on upland near San Juan Capistrano were infested with larvae of the sugarbeet armyworm.

ALFALFA LOOPER (*Autographa californica* Snover)

California. J. C. Elmore (March 21-27): Adults of the alfalfa looper were collected from tomato piles on upland areas near Santa Ana.

APHIDS (Aphidae)

Florida. J. R. Watson (April 23): A very heavy infestation of the green peach aphid (*Myzus persicae* Sulz.) occurred on potatoes in the Hastings section.

California. J. C. Elmore (April 5): Aphids were numerous on early tomatoes on upland at San Juan Capistrano. Treatment was necessary.

LEAF-FOOTED BUG (*Leptoglossus phyllopus* L.)

Texas. F. L. Thomas (April 2): Leaf-footed bugs appeared practically over night at Houston after a good rain. They are working on the tops and tender parts of potato plants.

BEANS

MEXICAN BEAN BEETLE (*Epilachna corrupta* Muls.)

Delaware. L. A. Stearns (April 15): Seventy-five percent mortality in hibernation cages at Newark.

Georgia. T. L. Bissell (April 22): The first Mexican bean beetle of the season was found on snap beans today at Experiment. In 1934 the first beetle was found on May 11.

Ohio. M. F. Howard (April 23): The survival of the Mexican bean beetle in hibernation cages at Columbus is the lowest for several years.

Mississippi. E. W. Dunnam (April 25): A single specimen of the Mexican bean beetle was found feeding on garden beans at Leland.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

South Carolina. W. C. Nettles (April 20): Bean leaf beetles were reported by truckers in the eastern part of the State.

Georgia. O. I. Snapp (April 11): The bean leaf beetle has caused considerable damage to the bean crop around Fort Valley. It is abundant and a number of complaints have been received.

T. L. Bissell (April 22): Bean leaf beetles and feeding holes are numerous on snap beans at Experiment.

Mississippi. C. Lyle and assistants (April 23): The bean leaf beetle was causing trouble in Greene, George, and Jackson Counties as early as March 30. Injury in Hattiesburg and vicinity, Forrest County, was observed later.

E. W. Dunnam (April 8): Bean leaf beetles were noted injuring the foliage of young beans in Washington County.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Alabama. J. M. Robinson (April 20): The belted bean beetle is scarce.

Texas. J. M. Eoney (March 1): Adults are feeding on onions, turnips, radishes, cabbage, and mustard at Dickinson.

California. J. C. Elmore (March 27): Adults of this cucumber beetle are common on weeds surrounding early bean fields in Peter's Canyon, Santa Ana.

PEAS

PEA APHID (Illinoia pisi Kalt.)

South Carolina. M. B. Stevenson (April 20): Severe damage to garden peas observed in Orangeburg County.

Mississippi. C. Lyle (April 23): Heavy infestations of the pea aphid on English peas were reported recently from Carroll, Humphreys, Copiah, and Leflore Counties.

California. E. C. Essig (April 24): The pea aphid is quite abundant in the Milpitas pea-growing district, where considerable damage is being caused to extensive plantings.

## CABBAGE

### CABBAGE INSECTS (Lepidoptera)

South Carolina. W. J. Reid and C. C. Bare (April 20): The cabbage looper (Autographa brassicae Riley), the imported cabbage worm (Ascia rapae L.), and the diamond-back moth (Plutella maculipennis Curt.), the three species of cabbage worms most common in the vicinity of the South Carolina Truck Experiment Station at Charleston, have been much less abundant this spring than usual. This is probably due to the unusually cold weather of the past winter. The total infestation to date on heading cabbage in an experimental planting has not equaled 0.5 worm per plant. The order of abundance, from least to most, is as listed above.

### IMPORTED CABBAGE WORM (Ascia rapae L.)

Pennsylvania. H. E. Hodgkiss (April): Adults of the imported cabbage butterfly were seen in Adams County on April 16 and in Centre County on April 20.

Ohio. M. F. Howard (April 23): An adult was observed in flight at Marietta on March 24 and another at Columbus on April 4.

Tennessee. G. M. Bentley (April 24): The cabbage butterfly is very common.

Mississippi. C. Lyle and assistants (April 27): Injury to cabbage, ranging from medium to severe, has been reported in the trucking sections of Lincoln, Neshoba, and Jones Counties for the last several weeks.

Louisiana. W. E. Hinds (April 27): Eggs have been found on cabbage and collards since about the middle of February but have not been as abundant as usual.

Missouri. L. Haseman (April 23): On warm days during the month imported cabbage butterflies have been observed in small numbers at Columbia.

### SOUTHERN CABBAGE WORM (Ascia protodice B. & L.)

Missouri. L. Haseman (April 23): At Columbia the native cabbage butterfly is more abundant than the imported species.

Texas. F. L. Thomas (April 5): Several larvae two-thirds grown were found on Japanese turnip at College Station.

### DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

Texas. J. M. Roney (March 6): Adults of the diamond-back moth were observed



in turnips at Dickinson and Sugar Land.

Utah. G. F. Knowlton (April 20): Adults are very abundant in some parts of Weber County, and moderately abundant in parts of Box Elder, Cache, and Davis Counties.

Arizona. K. B. McKinney (March): Larvae of the diamond-back moth are very abundant over a wide area of the desert in southern Arizona. They are feeding in large numbers on one of the wild mustards, Lepidium lasiocarpum, in some instances as far as 25 miles from any of the cultivated districts. The larvae were not found on any plants other than mustard.

#### HARLEQUIN BUG (Murgantia histrionica Hahn)

South Carolina. W. C. Nettles (April 20): Destructive late in March in Kershaw County.

Georgia. T. L. Bissell (April 3): Adult bugs abundant on fruiting collard plants kept for seed at Experiment. About one-fourth of fruit stalks were killed. Bugs beginning to lay eggs.

Alabama. J. M. Robinson (April 20): The harlequin cabbage bug is abundant and active in the central and southern parts of the State.

Mississippi. C. Lyle and assistants (April 23): The harlequin cabbage bug is quite numerous in Monroe County for this time of the year. Heavy infestations of adults and abundant egg masses were observed in Coahoma County in both field and plant beds on April 3. A correspondent in Lincoln County reported them very abundant in his garden.

#### CABBAGE APHID (Brevicoryne brassicae L.)

Mississippi. C. Lyle and assistants (April 23): Considerable damage by the cabbage aphid has been noted in Lincoln and Copiah Counties during the past month. The aphids were observed in fields and plant beds in Bolivar County on April 3.

#### ONION

##### A MITE (Petrobia tritici Ewing)

Texas. S. E. Jones (April 5): Three fields of onions at Encinal are infested. These fields have been infested continuously for several years. (Det. by H. T. Ewing, who says the mite has been known only as a wheat pest.)

#### STRAWBERRY

##### SOWBUGS (Oniscidae)

Alabama. J. M. Robinson (April 20): Strawberries at Auburn are being

attacked by sowbugs.

Mississippi. C. Lyle (April 27): Recent rains have increased damage from pillbugs to strawberries and tender garden plants in the vicinity of State College.

### PEPPER

#### PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (April 5): An average of 1 adult was found per foot of seed-bed row on upland near San Juan Capistrano, an unprecedented finding for this time of year. This condition is the result of continued weevil activity in a winter pepper field near the seed bed. Heavy rains prevented plowing the field until spring. Many adult weevils were observed (from 6 to 29 per plant) on pepper plants missed by the disc.

### BEETS

#### BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. G. F. Knowlton (April 2): Beet leafhoppers are more abundant than usual in Salt Lake, Tooele, and Utah Counties.

California. W. C. Cook (March 25): The abnormally cold, wet weather has retarded the development of the beet leafhopper in the San Joaquin Valley. Prior to the last week of March only a few nymphs were found, but during this week large populations of nymphs were observed in the Los Banos hills, Big Panoche, and Coalinga.

### TOBACCO

#### TOBACCO FLEA BEETLE (Epitrix parvula Fab.)

Maryland. D. J. Caffrey (May 1): Tobacco growers at Waldorf and Aquasco report serious damage in tobacco plant beds.

South Carolina. W. C. Nettles (April 20): Flea beetles (mainly E. parvula) are injurious in seed beds in the eastern part of the State.

Florida. F. S. Chamberlin (April 10): Very few tobacco flea beetles are present in tobacco beds or newly set tobacco plants in Gadsden County.

Tennessee. G. M. Bentley (April 24): The tobacco flea beetle is moderately abundant.

## FOREST AND SHADE - TREE INSECTS

### CANKER WORMS (Geometridae)

Connecticut. W. E. Britton (April 23): Eggs of fall canker worms (Alsophila pometaria Harr.) are extremely abundant on deciduous trees in southern and southwestern parts of the State and another canker worm season is expected. Eggs have not hatched as yet but a few warm days will bring them out.

California. S. Lockwood (April 23): Canker worms were found in two prune orchards in Sonoma. The larvae were half grown at the time, and considerable defoliation had occurred.

### BROWN-TAIL MOTH (Nygmia phaeorrhoea Don.)

Massachusetts. L. H. Worthley (March): The extremely cold weather of a year ago was responsible for the reduction in infestations. However, in locations where the webs were on low-hanging bushes near stone walls, the drifted snow protected the webs and the caterpillars survived. Recently the district inspector at Amherst found 75 brown-tail webs, containing living larvae, on one apple tree.

### HALF-WINGED GEOMETER (Phigalia titea Cram.)

Massachusetts. J. V. Schaffner, Jr. (April 19): In the hardwood forests of the eastern part of Massachusetts, moths of this species seem to be unusually common this spring.

### FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

New Hampshire. L. H. Worthley (April 22): An outbreak of forest tent caterpillars is expected in the Keene area, where 600,000 egg clusters were collected by school children in 3 weeks' time. At Walpole, last summer, most of the large shade trees were completely defoliated in the village section and apple orchards suffered heavy damage.

Vermont. L. H. Worthley (April 22): At a nursery in Putney numerous egg clusters of the forest tent caterpillar were removed from shipments of stock offered for inspection.

Mississippi. C. Lyle and assistants (April 23): An unusually heavy infestation of the forest tent caterpillar has occurred this month in the coast counties. The caterpillars occur principally on oak trees, but are also found on sweetgum, pecan, and other trees. A number of rosebushes have been defoliated.

### ASH

### BANDED ASH BORER (Neoclytus caprea Say)

Nebraska. M. H. Swenk (April 20): The banded ash borer was reported on  
ning ash trees in Knox Cou



ELM

ELM SCURFY SCALE (Chionaspis americana Johns.)

Maryland. E. N. Cory (April 26): Reported attacking elm at Chestertown.

ELM BORER (Saperda tridentata Oliv.)

Nebraska. M. H. Swenk (April 20): Reports of the elm borer working in elm trees were received from Chase, Logan, and Cass Counties from March 26 to April 17.

FIR

AN APHID (Dreyfusia piceae Ratz.)

New England. H. J. MacAloney (March): An examination was made of several areas in New Hampshire and northern Massachusetts, where infestations of the balsam woolly bark louse had been previously found. The winter has been favorable for the successful hibernation of the bark lice, and the survival is perhaps heavier than last year.

HEMLOCK

A BARK BORER (Melanophila fulvoguttata Harr.)

Vermont. H. L. Bailey (April 25): Serious damage by the spotted hemlock borer reported at Basin Harbor and Ferrisburg.

HICKORY

A HICKORY GALL APHID (Phylloxera sp.)

Texas. F. L. Thomas (April 1): Serious injury of hickory is expected because of the abundance of Phylloxera sp., at Henderson.

JUNIPER

JUNIPER WEBWORM (Dichomeris marginellus Fab.)

Ohio. J. S. Houser (April 16): Causing damage to nursery stock, especially Irish juniper, in Strongsville.

LARCH

LARCH CASE BEARER (Coleophora laricella Hbn.)

Massachusetts. J. V. Schaffner, Jr. (April 19): Counts of the hibernating larvae and dissections of sample collections from observation plots in New England and northern New York indicate that the present infestation is fully as serious as in 1934.

New York. R. E. Horsey (April 23): A number of overwintering cases of the

larch case bearer were found on American larch at Rochester, and a severe infestation on a large planting of young larch trees was reported. The twigs were said to be "fringed" with the overwintering cases.

#### MAPLE

##### JAPANESE MAPLE SCALE (Leucaspis japonica Ckll.)

Connecticut. R. B. Friend (April 23): This scale is abundant on a row of Norway maple street trees in New Haven.

New York. E. P. Felt (April 23): The Japanese scale is somewhat abundant at Lawrence, L. I., and generally present at Freeport, L. I., although in both localities the numbers of the scales appear to have been greatly reduced by the extreme cold of the winter of 1933-34.

#### OAK

##### WATER-OAK SCALE (Lecanium quercifex Fitch)

South Carolina. J. A. Berly (April 20): Observed in abundance on oak in many places over the State.

Georgia. T. L. Bissell (April 11): All water oaks in McDonough appear to be infested. (Det. H. Morrison.)

##### HORNED OAK GALL (Andricus cornigerus O. S.)

Mississippi. C. Lyle (April 23): A heavy infestation of galls caused by A. cornigerus was found on water-oak trees at Kosciusko on March 30.

#### PINE

##### EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Northeastern United States. J. V. Schaffner, Jr. (April 19): The severe cold in the winter of 1933-34 caused a tremendous mortality of the European pine shoot moth in southern New England and New York, almost exterminating the pest in some plantings in eastern Massachusetts. However, it has been found that on low-growing pines, especially Pinus montana mughus, enough R. buoliana survived to build up considerable infestations in several localities. Collections taken this spring from mugho pine have shown a mortality from all causes other than parasitization of 21 percent at Lynn, Mass., and of 22 percent at Belmont, Mass., while collections on red pine from southern Connecticut and Long Island, N. Y., have shown mortalities ranging from 27 to 79 percent.

##### A BARK APHID (Aphiidae)

North Carolina. R. W. Leiby (March 13): A bark aphid is present on white pine in average numbers and is the source of some complaint in Biltmore, a suburb of Asheville.

SCOTCH PINE LECANIUM (Toumeyella numismaticum Pettit & McDaniel)

Michigan. E. I. McDaniel (April 30): Today we received a specimen from Marion, where it was infesting Jack pine. This is one of the first records that we have had of this species on wild trees.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Pennsylvania. E. P. Felt (April 23): The pine needle scale was found in small numbers on hemlock from the Philadelphia area. This insect is rather common, and occasionally occurs in great abundance on various pines, especially the Austrian pine. The scale was abundant on a small Colorado blue spruce from Denver, Colo.

TULIP TREE

TULIP TREE SCALE (Toumeyella liriodendri Gmel.)

North Carolina. R. W. Leiby (March 13): A few complaints concerning this insect indicate severe injury in places near Scotland Neck.

I N S E C T S   A F F E C T I N G   G R E E N H O U S E

A N D   O R N A M E N T A L   P L A N T S

A CHIRONOMID (Spaniotoma sp.)

Michigan. E. I. McDaniel (April 11): On March 21 a greenhouse man in the vicinity of Detroit brought a quantity of radishes grown under glass into the laboratory for examination. They were badly scarred by the work of a maggot, belonging to the genus Spaniotoma, probably stercoraria DeG. This is the first time this species has been reported doing damage to crops grown under glass in Michigan. (Det. A. Stone.)

CUBAN-LAUREL THRIPS (Gynaikothrips uzeli Zimm.)

Florida. J. R. Watson (April 23): The Cuban-laurel thrips has been very destructive on one estate at Boca Grande.

TWO-MARKED TREE HOPPER (Enchenopa binotata Say)

Connecticut. E. P. Felt (April 23): The two-spotted tree hopper attracted notice in Redding, through the numerous waxy coverings over areas where eggs had been deposited on ornamentals.

WHITEFLIES (Aleurodidae)

Mississippi. C. Lyle and assistants (April 23): Very heavy infestations of whiteflies on ornamental plants were observed recently at Jackson, Morton, Magee, and Piney Woods.



OYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

Kentucky. W. A. Price (April 26): The oyster-shell scale is more abundant than usual.

Minnesota. A. G. Ruggles (April 22): Oyster-shell scale abundant in neglected orchards and on cotoneaster hedges wherever these are grown in the State.

ARBORVITAE

ARBORVITAE APHID (Dilachnus thujaefilina Del Guer.)

Mississippi. C. Lyle and assistants (April 23): The heaviest infestation of aphids, probably D. thujaefilina, on arborvitae in years is reported at Aberdeen. General infestations occurring in other parts of the State have been reported.

Oklahoma. F. A. Fenton (April 23): The usual amount of damage caused to arborvitae is being noticed.

AZALEA

LACEBUGS (Tingididae)

Mississippi. C. Lyle (April 23): Undetermined species of lacebugs were heavily infesting azaleas at Columbus on March 30.

CAMELLIA

SCALE INSECTS (Coccidae)

Mississippi. C. Lyle and assistants (April 23): Fiorinia theae Green and Lepidosaphes camelliae Hoke were reported as moderately abundant on Camellia japonica plants in Jackson. Serious injury to this plant at Aberdeen was also reported.

DEODAR

DEODAR WEEVIL (Pissodes deodarae Hopk.)

Mississippi. C. Lyle (April 23): Serious damage by the larvae was found on Cedrus deodara twigs received from Waynesboro on April 1.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips gladioli M. & S. )

Florida. J. R. Watson (April 23): The gladiolus thrips increased in numbers and reached serious proportions in several sections of the State.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicis Curt.)

New York and Pennsylvania. E. P. Felt (April 23): The holly leaf miner was found to be rather abundant on a number of trees near Philadelphia, Pa., and also at Locust Valley, N. Y.

Mary K. Peters (April 23): The holly leaf miner has damaged holly leaves on Long Island.

OLEANDER

OLEANDER APHID (Aphis nerii Fonscol.)

Florida. J. R. Watson (April 23): The oleander aphid has been very abundant on new sprouts.

PRIVET

A SCALE INSECT (Parlatoria oleae Colv.)

California. E. O. Essig (April 24): I have received some splendid specimens from Fresno, where they were taken from California privet.

ROSE

ROSE APHID (Macrosiphum rosae L.)

Tennessee. G. M. Bentley (April 24): Aphids are moderately abundant on roses.

Kansas. H. R. Fryson (April 27): New growths of roses are becoming infested with aphids. The usual population of lacewings and ladybeetles is found associated with aphid infestations.

SUMAC

SUMAC BEETLE (Blepharida rhois Forst.)

Florida. J. R. Watson (April 23): The sumac beetle was quite injurious to Brazilian pepper (Schinus) in the southern part of the State.

YUCCA

A YUCCA MOTH (Tegeticula sp.)

Utah. G. F. Knowlton (April 5): Yucca moths have been seriously damaging yucca seed pods (desired for roadside planting) in the Kanab-Mount Carmel area.

INSECTS ATTACKING MAN AND

DOMESTIC ANIMALS

MAN

A MOSQUITO (Aedes cantator Coq.)

Delaware. L. A. Stearns (April 23): Abundance of half-mature larvae observed in salt marsh areas about Rehoboth Bay, Sussex County.

BOXELDER BUG (Leptocoris trivittatus Say)

Michigan. E. I. McDaniel (April 11): The boxelder bug has been increasing in numbers in Michigan for the last 3 years. From the first of January to the 10th of April complaints have been received from many localities.

Iowa. C. J. Drake (April 27): Boxelder bugs are being reported from all over the State.

Nebraska. M. H. Swenk (April 20): Reports of boxelder bugs were received from Howard and Pierce Counties on March 22 and March 27, respectively.

Utah. G. F. Knowlton (April 2): Boxelder bugs are very annoying at an electric power plant in Logan Canyon.

SAND FLIES (Chironomidae)

Mississippi. C. Lyle and assistants (April 23): Sand flies are very abundant and annoying in sections of Pascagoula and Moss Point.

Missouri. L. Haseman (April 23): An epidemic of a fair-sized species of punky has been annoying livestock and man at Columbia.

BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

Louisiana. H. A. Jaynes (March 28): A spider was collected on the gangplank of a boat at Houma, and was determined as the black widow.

Missouri. L. Haseman (April 23): The first specimen of the black widow spider, a full-grown female, was brought to the office on April 22.

Nebraska. M. H. Swenk (April 20): Inquiries or reports of black widow spiders came from Harlan and Webster Counties on March 31 and April 2, respectively.

Utah. G. F. Knowlton (April 20): Black widow spiders have recently been picked up at Kayville, Layton, Logan, Clearfield, Farmington, and Ogden. They appear to be fairly abundant in these localities.



AMERICAN DOG TICK (Dermaeontor variabilis Say)

Maryland and Virginia. F. C. Bishopp (April 30): Reports indicate that this tick is quite abundant in the District of Columbia and nearby Maryland and Virginia. Some dogs are said to carry as many as 50 ticks. The pest began to appear early in April and increased markedly toward the end of the month.

CATTLE

SCREW WORMS (Cochliomyia spp.)

Georgia. E. C. Cushing (May 1): R. A. Roberts, of the Savannah laboratory, reports that screw worm cases are of frequent occurrence in the southern counties. Counties in the vicinity of Savannah reported two such cases each. Infestations are appearing as far north as Fulton and McDuffie Counties. The laboratory is receiving an increasing number of requests daily from county agents and stockmen for materials to treat cases.

Florida. E. C. Cushing (May 1): W. V. King states that replies received from 22 county agents in north-central Florida from April 11 to 15 indicate an increasing number of cases in 15 counties and a rapid increase in 2 others. Infestations are occurring in central Florida in areas uninfested last year. Many cases were reported from southwestern counties during the last 10 days of April. There is every indication that the number of cases will show a rapid increase in the northern counties during May. Later reports indicate that serious trouble is developing in Highlands and Osceola Counties.

Texas. E. C. Cushing (May 1): At Sonora it has been reported that screw worm flies have been rapidly increasing since the first of April, notwithstanding the continued dry weather.

D. C. Parmen (April 30): A great many screw worm cases were reported around Uvalde late in March and early in April, but the cool weather later in April checked the pest. There are now about three cases per 1,000 head in sheep and one per 1,000 head in cattle.

HORN FLY (Haematobia irritans L.)

Mississippi. C. Lyle (April 23): Inspector F. A. Smith reports that the horn fly was very abundant at Courtland on April 18.

Missouri. L. Haseman (April 22): As yet horn flies have not appeared in any numbers on cattle.

Kansas. H. R. Bryson (April 27): E. G. Kelly reported the horn fly as attacking cattle for the first time this year on April 5 in Clay County and on April 4 in Washington County.

STABLE FLY (Stomoxys calcitrans L.)

Missouri. L. Haseman (April 22): As yet stable flies have not appeared in any numbers on cattle.

Kansas. H. R. Bryson (April 27): L. G. Kelly reported the stable fly as attacking cattle for the first time this year on April 4 in Washington County, and on April 5 in Clay County.

CATTLE GRUBS (Hypoderma spp.)

Missouri. L. Haseman (April 22): Apparently all grubs have left the backs of cattle.

Mississippi. C. Lyle (April 23): Inspector F. A. Smith reported that ox warbles (H. lineatum DeVill.) were causing considerable annoyance to cattle at Coldwater on April 2.

SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus Nitz.)

Kansas. E. G. Kelly (April 27): On April 4 the short-nosed ox louse was very abundant and doing much damage to six herds of cattle examined in Clay County.

EAR TICK (Ornithodoros megnini Duges)

Kansas. H. R. Bryson (April 27): On April 1 the spinose ear tick was reported in one herd of cattle at Tescott. Some cows in this herd were brought to Ottawa County from Wallace County in 1930. E. G. Kelly previously reported finding these ticks in considerable numbers in Wallace County.

Texas. O. C. Babcock (April): The spinose ear tick is more abundant than usual and is causing considerable damage to livestock, especially in the areas south of Sonora.

HORSES

A BUFFALO GNAT (Eusimulium pecuarum Riley)

Mississippi. C. Lyle and assistants (April 23): Buffalo gnats were observed near Drew, in Sunflower County, on March 30 and at Savage, Tate County, on April 18. The gnats were very annoying to mules, sheep, and other animals at Moss Point, Jackson County, on March 26 and quite numerous at Neely, in Greene County, on April 13. Both are new areas for the gnats in Mississippi.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

New Hampshire. L. C. Glover (April 23): On April 16 the common termite R. flavipes Kol. was swarming in one of the buildings in Durham.

Connecticut. M. P. Zappe (April 22): Termites are either more abundant than ever before or people are becoming more conscious of their presence. We have had about 25 complaints since January 1.

New York. Mary K. Peters (April 23): There is a serious infestation of termites on Long Island. I am receiving complaints almost every day.

Pennsylvania. T. L. Guyton (April 23): Reports of the occurrence of termites in the Philadelphia district are rather numerous.

Delaware. L. A. Stearns (April): Frequent reports of damage were received from various localities.

Maryland. E. N. Cory (April 26): Infestations in houses.

Georgia. O. I. Snapp (April 6): Termites are about as abundant as usual in Fort Valley, in buildings. They were swarming on April 6, and the usual complaints are coming in.

Ohio. T. H. Parks (April 24): Termites are very abundant and we receive many calls each week asking for methods of control.

N. F. Howard (April 23): Swarms of winged termites have been observed in Columbus for the past 2 weeks. On April 20 several people observed thousands of these insects at various locations in the northern end of Columbus.

Illinois. W. P. Flint (April 23): Many reports of damage are being received. In many cases serious injury to buildings occurred before the insects were discovered.

Michigan. E. I. McDaniel (April 11): The termite situation in Michigan is about the same as it has been for the last 4 or 5 years. However, people are giving it more consideration since the Federal Housing Committee insists that houses be put up termite proof. Complaints of termites have been received from many localities since January 1.

Iowa. C. J. Drake (April 27): White ants are doing serious damage in the floors and woodwork of buildings in Keokuk and Denmark.

Missouri. L. Haseman (April 23): An unusual number of colonies of termites were swarming in Columbia during the month.

Mississippi. E. W. Dunnam (April 5): Termites were reported to be damaging the foundation and floor joists of a residence at Ieland.



Nebraska. M. H. Swenk (April 20): A report of termites (R. tibialis Bks.) working at the roots of a tree in Harlan County was received on April 9. On April 17 a report was received from Fillmore County of a residence infested with termites.

Texas. F. L. Thomas (April): Termites were infesting dwellings at Dallas and Fort Worth on April 18. Three houses were infested at Corpus Christi on March 20, and termites were swarming at Hearne on April 4.

#### ANTS (Formicidae)

Georgia. T. L. Bissell (April 25): Ants are reported as being very troublesome at Newnan in houses and yards; killing strawberry plants by loosening soil from the roots; invading hens' nests and killing hatching chicks; and injuring boxwood at Griffin by loosening soil at the roots.

Louisiana. H. C. Young (March 24): On March 24, a piece of clothing in a hotel at Monroe was literally covered with several thousand fire ants (Solenopsis xyloni McCook). During the night the ants had congregated on the garment and eaten numerous holes in it. A few ants were distributed throughout the room. The manager of the hotel informed me that they had been troubled with ants for several years on the ground floor, and that since last July they have been annoying on the upper floors.

Mississippi. C. Lyle (April 23): Fire ants (S. xyloni) are generally abundant in all sections of the State, being especially noticeable in strawberry fields and in gardens.

M. R. Smith (March 22): On March 22 a correspondent at Pheba sent in winged queens of the fire ant S. xyloni. A correspondent at Columbus wrote of this ant, "they are taking possession of my strawberry, asparagus, and rose patches." (April 21): Carpenter ants of the species Camponotus caryae rasilis Wheeler were found infesting houses at State College, and acrobatic ants, Cremastogaster ashmeadi Mayr, have been giving telephone officials in West Point trouble for a number of years. The ants short circuit telephone wires in rainy weather by removing the rubber insulation from the wires in the terminal boxes, as well as the insulating material back of the porcelain plate. At Starkville the writer saw hundreds of C. laeviuscula var. clara Emery invading an artificial bird nest. Many winged queens of Pheidole sp. were swarming at College Station on March 26.

#### BROAD-HORNED FLOUR BEETLE (Gnathocerus cornutus Fab.)

Kansas. G. B. Wagner (March): During the month a number of adults, larvae, and pupae of the broad-horned flour beetle were taken from a flour mill in Kansas City. This is the second time this species has been taken in the southwestern milling district. One specimen was taken from a mill in central Kansas in 1932. Data gathered since the insect was found seem to indicate that it came into the mill from some patent flour, very probably returned from an eastern or southern customer.

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis L.)

California. F. S. Stickney, D. F. Barnes, and Perez Simmons (November): In November 1934 cucujid beetles were numerous in fallen dates at the Government Date Garden near Indio. Specimens have been identified as the saw-toothed grain beetle. The abundant occurrence out of doors of this pest of stored materials probably has not been recorded before in the United States.

A DERMESTID (Trogoderma tarsalis Melsh.)

Maryland. E. N. Cory (April 26): Several reports have been received of the presence of larvae in houses.

INSECT CONDITIONS IN HAITI FOR MARCH AND APRIL 1935

By  
André Audant

Reports from Jacmel and Gonaives indicate that the boll weevil (Anthonomus grandis Boh.) is gradually disappearing from the cotton plantations. In some instances the weevils have punctured the petioles of the bolls. They are apparently going under trash, as the harvest season comes to an end.

The last broods of cotton stainers, Dysdercus spp., are dwindling away in the advanced cotton fields of the Cul de Sac plain.

Citrus whiteflies (Aleurodidae) have been observed in connection with the green scale (Coccus viridus Green) and sooty mold around Petionville.

The onion thrips (Thrips tabaci Lind.) has become quite abundant in gardens of the Port au Prince district.

The first generation of Feltia annexa Treit. has appeared in newly planted fields of potatoes on the Rochelois ridge, attacking tubers at 10 cm below the surface.

Crickets, Gryllus sp., have been observed cutting the tender buds of roses in the vicinity of Port au Prince.

Calpodes ethlius Cram. is severely damaging canna beds in the district of Damien.

INSECT NOTES FROM PUERTO RICO FOR APRIL 1935

G. N. Wolcott reported on April 10, that a serious and destructive outbreak of the onion thrips (Thrips tabaci Lind.) has recently developed and threatens to destroy almost the entire crop on the extensive plantings of onions, made in many parts of the island by the Relief Administration.

Spraying was begun too late to be of much value and an extended drought now eliminates all possibility of control.

Mr. Wolcott also reports that the present drought is responsible for the appearance of the cottony-cushion scale (Icerya purchasi Mask.) in noticeable abundance at various points in the previously infested area, but none of the citrus growers coming to the laboratory for a supply of Rodolia cardinalis Muls. to release in their groves, report a heavy infestation. The scale has spread very little, not yet (April 10) having reached Vega Baja in its westward dispersion.

F. C. Bishopp reported on April 16 that specimens of flies sent to the Bureau by H. L. Van Volkenberg, parasitologist of the Puerto Rico Agricultural Experiment Station at Mayaguez, have been identified as Cochliomyia americana Cushing and Patton. This is the species that has recently caused so much damage to livestock in the Southeastern States. While the fly is known to be present on other islands in the West Indies, this is the first authentic record of its occurrence in Puerto Rico.

#### INSECT CONDITIONS IN HAWAII FOR MARCH 1935

By

O. C. McBride

Cotton bolls have just reached the stage for infestation by the pink bollworm (Pectinophora gossypiella Saund.). Approximately 90 percent of the bolls are infested, the infestation ranging from one to seven larvae per boll. Parasitization (by 7 species of parasites) is quite low. Cotton from Waianae, Oahu, shows less than 0.5 percent parasitization and from Honolulu about 1 percent.

Although fruits were scarce during March, the abundance of the Mediterranean fruit fly (Ceratitis capitata Wied.) in citrus and mango orchards increased 50 percent over February. Parasitization at this season is very low--approximately 10 percent.

Reports indicate that the melon fly (Bactrocera cucurbitae Coq.) is doing considerable damage to Chinese cucumbers. Growers are trapping and covering fruits for protection.



# INSECT PEST SURVEY BULLETIN

Vol. 15

Supplement

No. 3

## TRIAL SURVEYS OF CHINCH BUGS IN HIBERNATION, NOVEMBER 1934 TO MARCH 1935

By C. M. Packard, C. Benton, and Staff of West Lafayette, Ind., Laboratory,  
Division of Cereal and Forage Insect Investigations,  
Bureau of Entomology and Plant Quarantine,  
U. S. Department of Agriculture

-----

### Purpose of Surveys

The studies reported herein were made during the winter of 1934-35 in the vicinity of Lafayette, Ind., to gain information on winter survey methods and to obtain estimates of chinch bug abundance in hibernation quarters for comparison with surveys of the same areas at other times of year. The ultimate objective is to determine the comparative practicability and dependability of fall surveys in standing corn, winter surveys in hibernation quarters, and spring surveys in small grains, as bases for forecasting chinch bug abundance in corn the following summer.

### Method of Sampling

For the purposes of this study it appeared essential that the total number of bugs present in each sample be determined. Therefore, on account of the large numbers of bugs and large amount of material contained in square-foot samples, it was necessary to reduce the size of the sample materially in order to handle the number desired with the time and help available. It also seemed essential to have the individual samples completely made up of the particular hibernation medium being sampled, a thing very difficult to do if square feet were taken, as samples that large unavoidably include variable quantities of extraneous material. For these reasons, the size of sample was set at 1/5 square foot, the area enclosed by a wire or sheet-iron ring of 6-1/16 inches in diameter. This size was used throughout the survey trials, except for two series of 1-square-foot samples taken from woodland leaves and litter, and one series of 1-square-foot samples taken from big bluestem grass for comparison with 1/5-square-foot samples taken from the same locations. The sampling was further restricted as far as possible to well-drained south and west exposures, the locations where bugs were most likely to be found.

Several methods were used for extracting the bugs from the samples. (1) Direct dissection over a large sheet of oilcloth or paper, removing and counting the bugs as they emerged or were uncovered. (2) Direct dissection and sifting, first with a fine sieve to remove soil, then with a coarse sieve to remove the coarse litter, and finally counting and removing bugs as they emerged or were uncovered from the remainder. (3) Use of Berlese funnels under steam pipes to drive bugs by means of heat into collecting jars containing alcohol. (4) Submergence and dissection of sample in a tub of water to float out the bugs. For lightly infested samples methods 1 and 2 were best, but for heavily infested samples methods 3 and 4 were preferable.

### Variation among Individual Samples

The numbers of bugs in individual samples were extremely variable, even when taken from the same kind of grass and as nearly as possible from the same location. For instance, six 1/5-square-foot and six 1-square-foot samples, all taken from big bluestem grass within 100 yards along a well-drained southward sloping roadside, varied as follows:

Size of sample :	Bugs per sample		
	: Minimum:	Maximum:	Average
	: <u>Number:</u>	<u>Number:</u>	<u>Number</u>
1/5 square foot:	14	: 236	: 107
1 square foot--:	282	: 3,169	: 916

Further evidence of the extreme variability in numbers of bugs in individual samples is given in the following comparison between 1/5-square-foot and 1-square-foot samples. Twenty-five pairs were taken from the most favorably located clumps of big bluestem in a fairly uniform area about 2 miles square, each pair consisting of adjacent 1/5-square-foot and a 1-square-foot samples from the same clump of grass, with the following results:

Size of sample :	Bugs per sample		
	: Minimum :	Maximum :	Average
	: <u>Number</u> :	<u>Number</u> :	<u>Number</u>
1/5 square foot--:	1	: 2,863	: 340
1 square foot---:	49	: 3,169	: 676

Notwithstanding efforts to take the above samples from as uniform an environment as possible the variation between those of either size was very great. The data were analyzed by the usual statistical methods but the results are not given here because the methods of analysis commonly used were apparently not applicable to this experiment. The distribution of chinch bugs in hibernation is so uneven that a great many more and also much larger samples, perhaps entirely on an area basis, irrespective of host plants, would probably be necessary before the data would approach anything like a



normal distribution susceptible of the usual statistical treatment. Such an experiment would be time-consuming and of little, if any, practical value.

Although the 1-square-foot samples varied less among themselves in this experiment and hence were possibly more reliable indicators of population than the 1/5-square-foot samples, there is probably not enough difference in variation to justify the increase in work involved in their examination. Furthermore, reducing the size of the sample makes it possible to handle a larger number of them per given area in the time available, probably affording better chances of finding bugs if present.

The 1/5-square-foot samples also indicated a much higher infestation than did the 1-square-foot samples. Probably this would be generally true because the smaller samples would naturally be taken from the best parts of the grass clumps, while the larger samples would necessarily include a varying amount of the sparse vegetation less likely to harbor bugs. This very limited experiment would indicate that the number of bugs per 1/5 square foot should be multiplied by two instead of five, to give the infestation to be expected in 1-square-foot samples composed entirely of grass. This relationship would undoubtedly be variable, depending on kind of grass, method of sampling, and other factors.

#### Replicated Survey of Tippecanoe County

Between November 22 and December 14, 1934, 180 1/5-square-foot samples were taken in Tippecanoe County, 20 being taken from each of the 9 areas sampled during the previous fall survey in standing corn, the entire county being roughly divided into three rows of 3 areas each. The sampling was restricted to well-drained south and west exposures and to the bunch or tuft-forming grasses, exclusive of timothy. The most favored grasses were not present throughout all the areas, hence it was necessary to take the samples from the best ones available. Twelve species were involved, the number of samples being as follows: *Andropogon furcatus*, 81; *Andropogon scoparius*, 2; *Elymus canadensis*, 19; *Elymus virginicus*, 15; *Elymus striatus*, 24; *Sporobolus asper*, 15; *Tridens flavus*, 4; *Panicum virgatum*, 13; *Atheropogon curtipendulus*, 2; *Hystrix hystrix*, 1; *Sorghastrum nutans*, 3; *Spartina michauxiana*, 1.

The number of chinch bugs in each sample was determined and the data were made up into 20 sets, each set including 1 sample from each of the 9 areas so as to be representative of the entire county, no sample being used in more than 1 set. Thus each representative county sample was a completely independent set of 9 1/5-square-foot samples. The results are summarized as follows: Number of 1/5-square-foot samples in county sample, 9; number of county samples, 20; average number of bugs per 1/5 square foot in county samples, minimum, 57; maximum, 358; mean, 140.

It is seen at once that the average number of bugs per county sample varied greatly, notwithstanding the attempts to reduce variation by restriction of the sampling to the most favorable host plants and exposures. Statistical analysis of these county samples by the usual methods was found to



be futile for the reasons already stated with reference to individual 1/5-square-foot samples, and the results are therefore not reported here. About all that can be said for the 20 replications in this experiment is that, although they varied greatly among themselves, they all showed infestations far above the level of 15 per square foot, established by the Illinois workers as indicative of abundant infestation. Assuming bugs present in the 1-square-foot samples to be double the number in the 1/5-square-foot samples, for reasons already explained, this experiment indicates the presence of about 280 bugs per square foot of bunch grass in the most favorable locations in Tippecanoe County.

Averaging the sets of 20 1/5-square-foot samples taken from each area indicated considerable variation in abundance of hibernating bugs in different parts of the county, as would be expected from the topography, which ranges from natural prairie with black soil, much corn, and bunch grass, to broken, more or less wooded country with more uncultivated land, gravelly or clay soil, more varied crops, less corn, and less bunch grass. The infestations by area were as follows:

Area	Type	Favored grasses	Bugs per 1/5 sq. ft.
			Number
Northwest-----	Prairie:	Abundant	393
West Central----	Mixed :	Common	94
Southwest-----	do. :	do.	136
North Central---	do. :	do.	132
Central-----	do. :	do.	157
South Central---	do. :	do.	84
Northeast-----	Broken :	Scarce	63
East Central----	do. :	do.	126
Southeast-----	Mixed :	Common	74

#### Surveys of Other Counties and Comparative Abundance of Bugs in Different Media

In addition to the replicated hibernation survey in Tippecanoe County, single surveys were made in the three neighboring counties covered last fall while the bugs were still in the cornfields. At least one 1/5-square-foot sample was taken from each ninth of a county and from each medium used. More than one set of samples of certain media were taken in some counties, for one reason or another, but all samples of each medium are combined in the following averages. One-square-foot samples were taken of the woodland types of cover, the results being divided by five for entry in the following table of results in terms of bugs per 1/5 square foot.

Hibernating media	: Average bugs per 1/5 square foot.			
	: by counties			
	: Fenton: Tippecanoe: Clinton: Tipton			
	: Number:	Number	: Number:	Number
All grasses-----	: 221	: 131	: 55	: 21
Bunch grasses, except timothy-----	: 288	: 140	: 28	: 47
Timothy-----	: 76	: 92	: 76	: 7
Bunch-type sedges-----	: --	: 15	: 17	: 5
Mat-type sedges-----	: --	: --	: --	: 10
Bluegrass-----	: --	: 4	: --	: --
Volunteer wheat-----	: --	: 2	: --	: --
Woodland leaves and litter-----	: --	: 5	: --	: --
Woodland leaves and litter, plus	:	:	:	:
small grass or sedge tufts-----	: --	: 10	: --	: --
Fall survey in corn, bugs per stalk--	: 13	: 10	: 4	: 0.3

These figures indicate infestation to be in the "abundant" range of 15 or more bugs per square foot in all four counties, even in the less favorable media. The above table gives at least a rough idea of the actual numbers of bugs present in the different types of cover in this year of extreme abundance. However, proper evaluation of different media would require data for years and areas of greater scarcity. In a general way, the comparative abundance of bugs in the different counties is similarly indicated by the different media, but determination of the actual infestation level evidently requires different indices for different media. That is, abundant infestation may perhaps be indicated by 15 bugs per square foot in the favored bunch grasses, 8 per square foot in timothy, 3 per square foot in bunchy sedges, 1 per square foot in woodland leaves, or from 10 to 15 per stalk in corn before fall migration. The meaning of certain infestation levels in different hibernation media is doubtless also affected by the comparative abundance of the different types of cover in different areas. However, the numbers of bugs present in small samples of any medium are so variable that much more extensive sampling than was possible in these experiments would be necessary to determine these points conclusively.

The time involved in taking and examining samples depends on several factors, such as condition of country and roads, type and abundance of hibernating media, number and size of samples, degree of infestation, and completeness of count. One man with an automobile could probably average two counties or more per day in practical survey work, taking 9 samples per county and not stopping to make counts. Complete counts of all bugs in samples might require several days per county, but by discarding samples as soon as enough bugs were found to determine the infestation level the work could be much shortened and under favorable conditions could be done at once in the field. Judging from these trials, a great many more than 9 1/5-square-foot or 1-square-foot samples would have to be taken in order to obtain more than a rough idea of chinch bug abundance in a county, in fact many more samples than would be possible with the funds ordinarily available for such work.



# Comparative Numbers of Chinch Bugs Hibernating in Different Grasses

The work of obtaining information on hibernation in different grasses was greatly facilitated by Philip Luginbill's knowledge of the species of grasses encountered. We were very fortunate in having his assistance with the field work and identification of grasses. In determining the comparative abundance of bugs in different kinds of grasses Andropogon furcatus (big bluestem) was used as the standard, this grass being rated at 100. The rating of each grass was determined by comparing the average infestation in all the samples of that grass taken from the various areas with the average infestation in all the samples of A. furcatus from the same areas. For instance, the average infestation in the 6 samples of T. flavus was 152, and the average infestation in the 23 samples of A. furcatus from the same areas was 141. The rating of T. flavus was therefore  $141:152::100:x$ , or 108. Certain grasses were more prevalent than others in different areas and it would have been obviously incorrect to make comparisons of the infestation in a species of grass in one locality with the infestation in another species under the different ecological and infestation conditions prevailing in another locality. All samples were taken from the most favorable exposures available. The woodland samples were all 1 square foot and were taken at or close to south edges of such areas. Some of the species represented by only one or a few samples may be far out of place, otherwise the rating below is thought to be fairly accurate for this year and region.

Hibernating media	: Rating	: $\frac{1}{\text{Rating}}$	: Samples	: Average bugs
			: Number	: per 1/5 sq. ft.
<u>Andropogon scoparius</u> (little bluestem)-----	223	: 10	: 254	
<u>Tridens flavus</u> (tall redtop)-----	108	: 6	: 152	
<u>Andropogon furcatus</u> (big bluestem)-----	100	: 108	: 198	
<u>Sporobolus asper</u> (long-leaved rush-grass)-----	93	: 18	: 127	
<u>Atheropogon curtispendus</u> (tall grama-grass)-----	78	: 2	: 58	
<u>Hystrix hystrix</u> (bottle-brush grass)-----	74	: 1	: 87	
<u>Elymus canadensis</u> (nodding wild rye)-----	58	: 33	: 118	
<u>Elymus virginicus</u> var. <u>submuticus</u> -----	58	: 1	: 69	
<u>Elymus virginicus</u> (Virginia wild rye)-----	50	: 9	: 146	
<u>Sorghastrum nutans</u> (Indian grass)-----	50	: 7	: 56	
<u>Dactylis glomerata</u> (orchard-grass)-----	46	: 3	: 119	
<u>Poa pratensis</u> (timothy)-----	43	: 57	: 86	
<u>Bremus inermis</u> (awnless brome-grass)-----	41	: 1	: 30	
<u>Elymus striatus</u> (slender wild rye)-----	37	: 34	: 47	
<u>Elymus striatus</u> var. <u>arkansanus</u> -----	36	: 2	: 40	
<u>Panicum virgatum</u> (switch-grass)-----	22	: 15	: 62	
Sedges (clump type)-----	9	: 25	: 16	
<u>Spartina michauxiana</u> (tall marsh-grass)-----	9	: 1	: 11	
Sedges (sparse or running type)-----	8	: 13	: 9	
<u>Elymus virginicus</u> var. <u>jejunus</u> (western wild rye):	5	: 10	: 7	
Woodland leaves and grass-----	5	: 10	: 10	
<u>Agropyron repens</u> (quack-grass)-----	3	: 1	: 2	
<u>Poa pratensis</u> (Kentucky blue-grass)-----	2	: 9	: 4	
Woodland leaves-----	2	: 10	: 5	
Volunteer wheat-----	1	: 19	: 2	

A. furcatus equals 100.



# Winter Mortality

Samples taken periodically from locations near Lafayette gave the following results:

	: January 7		: February 1		: February 20		: March 11		: April 5-12	
Hibernating media:	Total:	Dead	Total:	Dead	Total:	Dead	Total:	Dead	Total:	Dead
	: bugs:	bugs	: bugs:	bugs	: bugs:	bugs	: bugs:	bugs	: bugs:	bugs
	: No.:	$\frac{1}{2}$	: No.:	$\frac{1}{2}$	: No.:	$\frac{1}{2}$	: No.:	$\frac{1}{2}$	: No.:	$\frac{1}{2}$
Bunch grasses----	913	: 4	: 228	: 10	: 1,738	: 13	: 1,394	: 16	: 986	: 19
Timothy-----	471	: trace	: 25	: 8	: 129	: 21	: 12	: 17	: 174	: 37

Winter mortality obviously has not greatly reduced the prospect of severe infestations in 1935 in the area covered by this survey. Even with 20 percent reduction in numbers of hibernating bugs, a winter survival of over 200 bugs per square foot of bunch grass would still be indicated for Tinpecanoe County. The cause of mortality is not evident. Comparatively few of the dead bugs show macroscopic indications of disease.



# INSECT PEST SURVEY BULLETIN

Vol. 15

June 1, 1935

No. 4

## THE MORE IMPORTANT RECORDS FOR MAY 1935

During the third week in May grasshopper eggs started hatching in Wisconsin, Minnesota, and Wyoming. About the middle of the month vast swarms of these insects were invading southern Mexico, apparently flying in from Guatemala.

Outworm damage is reported as generally severe over a large part of the country, severe damage being reported from the Great Basin and from California.

Armyworm outbreaks, following heavy flights of moths, are reported from Virginia, Indiana, and Illinois westward to Nebraska and Oklahoma. Control methods for the protection of crops from these insects have been found necessary in parts of California.

Heavy infestations of grapes by the white-lined sphinx are reported from several points in central California.

A very heavy migration of the painted lady butterfly attracted considerable attention in Colorado and Utah. The moths, moving in a generally northward direction, were subsequently reported in Idaho.

Heavy defoliation of many kinds of trees by June beetles occurred in the North, Middle, and South Atlantic States westward to Minnesota and Kansas.

Over the area from Indiana westward to Missouri and Oklahoma the Hessian fly population is apparently increasing.

Chinch bug infestations were reported throughout the East Central States and westward to Iowa, Kansas, and Oklahoma.

Infestations of alfalfa and winter peas by the pea aphid are reported from Mississippi and Michigan, and westward to Nevada and the Pacific Northwest.

The alfalfa weevil has been found in two new localities in California and one new locality in Nevada. In California the population is very low.



Spring-brood moths of the codling moth were reported the first week in May from Delaware, and the second week in May from Pennsylvania. During the third week of the month moths were emerging in Ohio. In southern Indiana and Illinois they started emerging the first week in May. In general, populations were large.

The eastern tent caterpillar caused severe defoliation of wild cherries and, in some instances, of apples throughout the New England and Middle Atlantic States and westward to Ohio, Kentucky, and Tennessee.

Fruit aphids are generally scarce in the New England and Middle Atlantic States.

The plum curculio is from 2 to 3 weeks earlier than last year in the peach belt of Georgia, and appears to be generally abundant along the Atlantic seaboard, indicating that there will probably be considerable damage later in the season. In the drought area of last year in the Central States this insect is unusually scarce.

The changa, or Puerto Rican mole cricket, has been a serious pest for the first time in tobacco seed beds in North Carolina this spring.

Late in April and early in May Mexican bean beetle adults were observed in the field from Maryland and Virginia, westward to Ohio.

The number of boll weevils that successfully passed the winter in hibernation cages is smaller than it has been for the past few years in Louisiana and Oklahoma; while, on the other hand, Texas reports the heaviest emergence that has occurred during the past 10 years.

The heaviest emergence of cotton flea hopper from weeds recorded during the past 10 years was reported from Texas this month.

Considerable damage to cotton by the beet armyworm is reported from Texas, Arizona, and southern California.

Gypsy moth eggs started hatching earlier this year than last.

The elm leaf beetle apparently passed the winter successfully in New England.

The larch case bearer infestation, which has been under way in New England and New York in the past 3 years, is apparently persisting.

The screw worm is increasing rapidly throughout Florida and Texas. In one county in Florida 1,500 cases have been reported.

## GENERAL FEEDERS

### GRASSHOPPERS (Acrididae)

- Wisconsin. E. L. Chambers (May 21): Melanoplus mexicanus Sauss. and Camnula pellucida Scudd. were observed hatching in light sand areas in Marinette and Oconto Counties. Egg pods examined at various points in the 35 infested counties indicate that a few were destroyed during the winter.
- Minnesota. A. G. Ruggles (May 23): Grasshoppers are just beginning to hatch. Abundant only in neglected places.
- North Dakota. J. A. Munro (May 21): No hatching of grasshoppers as yet. Hatching delayed by cool spring.
- Montana. J. R. Parker (April): In March large quantities of eggs of C. pellucida, M. bivittatus Say, and M. mexicanus were dug from the ground in Sweet Grass County in south-central Montana and brought to the laboratory to rear grasshoppers for bait experiments. Nearly a 100-percent hatch was obtained whenever these eggs were held at a temperature of 80° F. for a period of 10 days.
- Wyoming. C. L. Corkins (May 25): Summer species of grasshoppers started hatching this week, following clear, warm weather, which was preceded by much rain and snow in May. All indications are that the infestations will be about as predicted last fall. This means that we shall spread about 10,000,000 pounds of grasshopper bait this summer.
- Utah. G. F. Knowlton (May 14): First-instar and second-instar grasshoppers have been generally present in northern Utah for 10 days or longer. Nymphs are moderately abundant throughout northern Utah. Slight damage to raspberry leaves was observed in north Ogden.
- California. C. C. Wilson (May 7): The grasshopper situation was of first importance in San Luis Obispo County in April. At least 5,000 acres of egg beds showed approximately 70 percent hatch on April 23 and the remaining eggs were in good condition. The warrior grasshopper (C. pellucida) and the valley grasshopper (Oedipoda miniata Scudd.) were the dominant species. Counts of live hoppers per square yard ran from 10 to more than 6,000. The stage of development ranged from first instar to adult, indicating that hatching has probably been continuous since the latter part of January. Most of the nymphs were in the first, second, and third instars. Poisoning operations were in progress and it was estimated that from 3,000 to 4,000 man-days will be required to control the grasshoppers in this county.
- Mexico. Warden Urquhart, Cia. Agricola La Zacualpa, S. C. P. A. (May 14): We are at present being invaded by a vast swarm of locusts flying in from Guatemala and Central America. Last year swarming occurred, but on a smaller scale. So far we have succeeded in keeping the locusts in movement by making plenty of noise. The real test will come when the hoppers hatch out, as great quantities of eggs are being laid all over



the country. We have a very large banana plantation here and the hoppers do great harm to the plants. The custom here is to drive the hoppers into ditches and turn flame throwers onto the massed hoppers. (Determined as Scaistocerca pararensis Burm. from notes in files of the Insect Pest Survey)

MORMON CRICKET (Arabus simplex Hald.)

Wyoming. C. L. Corkins (May 25): Mormon crickets are appearing in great numbers. In Sheridan County there are 20,000 acres of hatching beds, Johnson County about 4,000, Converse County 15,000, Crook County 5,000, and there are milder infestations in Washakie, Park, Lincoln, Hot Springs, and Teton Counties.

CUTWORMS (Noctuidae)

Vermont. H. L. Bailey (May 25): Cutworms, Agrotis unicolor Walk., were unusually abundant and were damaging gardens near Burlington on May 20.

Virginia. H. G. Walker (May 25): Cutworms have been reported as being very abundant, and injurious in some cornfields near Norfolk.

Ohio. T. H. Parks (May 25): Less than the usual number of reports have been received this month. Climbing cutworms were reported to be devouring the buds and foliage of apples and grapes in northeastern counties in May.

B. J. Landis (May 1): Cutworms are doing some damage to early cabbage at Columbus.

Indiana. J. J. Davis (May 25): Cutworms were reported as damaging sweet-clover at Greenfield on May 21. A few other sections reported cutworms as abundant, but no records were received of crops being attacked.

Michigan. R. Hutson (May 20): Various species of climbing cutworms are quite numerous around Hartford.

Wisconsin. E. L. Chambers (May 21): Early tomato and cabbage plants in the Milwaukee and Racine truck-farm areas were reported to be slightly damaged by cutworms.

Iowa. C. J. Drake (May 23): Cutworms are unusually abundant in gardens and cornfields. Infestations seem to be quite general in the State.

Tennessee. G. M. Bentley (May 22): Cutworms are occurring in unusual numbers throughout the State.

Nebraska. M. H. Swenk (May 20): Cutworms were reported from Antelope, Brown, Webster, and Nemaha Counties from May 5 to 16. Alfalfa and wheat were the chief crops affected. Numerous inquiries concerning the control of



cutworms in gardens have also been received from Lancaster County.

Kansas. H. H. Walkden (May 25): Adults of Chorizagrotis auxiliaris Grote were first taken at lights on April 16 at Manhattan and Hays, and at Garden City on April 18. Since May 14 this species has predominated in the catches at Garden City. Only one specimen was taken at Cherryvale up to May 20. Scotogramma trifolii Rott. predominated in Noctuidae taken at the trap lights during the first 3 weeks of May, the heaviest flight occurring from May 1 to 10. The adults were taken in greatest numbers at the Garden City light. Larvae were taken on lambsquarters on May 20 at Manhattan.

Arkansas. D. Isely (May 24): There has been an outbreak of the variegated cutworm (Lycophotia margaritosa saucia Hbn.), originating in bur-clover and alfalfa and moving to new crops in Lee and Saint Francis Counties. This cutworm is also abundant in northwestern Arkansas.

Idaho. R. W. Haegele (May 1): There has been a severe outbreak of climbing cutworms throughout the fruit district of southwestern Idaho this spring. The feeding started April 15 and damage is still being reported from some districts.

Utah. C. J. Sorenson (May 20): An undetermined species of cutworms observed in alfalfa fields at Park Valley. Climbing cutworms reported attacking peach buds at South Brigham. Parosagrotis orthogonia Morr. observed in dry-farm fall wheat at Cedar Valley, Utah County.

G. F. Knowlton (May 14): Cutworms destroyed three-fourths of the tomato plants in a 1-acre planting at Roy, Webster County, within 24 hours after they had been set out. Damage has also been reported from Kelton and Brigham. Cutworms destroyed an entire planting of carrots and cut off nearly half the young tomato plants set out on one farm at Orem. Serious damage to corn, tomatoes, and alfalfa was reported from Butlerville.

California. H. J. Ryan (April 25): A small larva, tentatively identified as the variegated cutworm (L. margaritosa saucia), has been found killing buds on pear trees in the Antelope Valley. The infestations appear to be general but not heavy.

A. F. Howland (April): L. margaritosa saucia is reported as very abundant at Lemon Heights, Santa Ana, Orange County, where it is attacking tomatoes. Damage is about 50 percent, a count yielding from 12 to 25 cutworms per plant. The worms are feeding on the foliage of the plants, which are from 6 to 8 inches high.

J. C. Elmore (May): The variegated cutworms are damaging gladiolus buds at Alhambra. They are boring into the long spikes, thus lowering the quality or destroying the flower spikes. About 30 percent of the heads are damaged.

ARMYWORM (Cirphis unipuncta Haw.)

- Virginia. H. G. Walker (May 25): Several wheat fields in the Norfolk area are heavily infested with armyworms. There are at least two species of hymenopterous parasites and one dipterous parasite, the latter being especially abundant.
- Indiana. J. J. Davis (May 25): The armyworm moths have been common at lights at La Fayette and elsewhere for the past month or more.
- Illinois. W. P. Flint (May 20): There have been several very heavy flights of armyworm moths during the past 3 weeks. Ten light traps on the University Farm caught from 20 to 1,000 moths per night during the period from May 1 to 20. On several nights the numbers exceeded 500. Examination of a number of specimens taken at random from these catches showed 44 percent gravid females.
- Missouri. L. Haseman (May 22): Severe outbreaks of armyworms two-thirds grown were reported from the southeastern part of the State on May 18. Moths are quite abundant at Columbia.
- Kansas. H. H. Walkden (May 25): A moderately heavy flight of adult armyworms occurred at Manhattan and Cherryvale lights during the first 3 weeks of May.
- Nebraska. H. H. Walkden (May 25): Only a few specimens of armyworms were noted at Lincoln at the light trap.
- Oklahoma. F. A. Fenton (May 22): A species of armyworm is reported to be abundant in wheat fields in the northeastern section of the State. (Det. by C. Heinrich as C. unipuncta.)
- California. Kern County Agr. Comm. (May 3): The first brood of armyworms is appearing and ditches have been thrown up around several vegetable fields.

BEEET WEBWORM (Loxostege sticticalis L.)

- Kansas. H. H. Walkden (May 25): Heavy flights of adults were noted at light traps as follows: At Manhattan on May 1 to 11; at Hays on May 7 and 8; and at Garden City on May 6. No flights were noted at Cherryvale. The greatest numbers were taken at Manhattan.
- Nebraska. H. H. Walkden (May 25): No heavy flights of this species occurred at Lincoln.

WHITE-LINED SPHINK (Sphinx lineata Fab.)

- California. S. Lockwood (May 24): In Madera, Fresno, Tulare, Kings, and Kern Counties grapevines have been severely defoliated in rather small



local areas by larvae of two sphinx moths, Pholus achemon Drury and S. lineata. The larvae are almost mature and are going into the ground. This, coupled with rather drastic control measures carried out by growers, is relieving the situation.

D. F. Barnes (May 20): The white-lined sphinx moth is plentiful locally. In many places in the San Joaquin Valley the larvae of the first generation have entered vineyards from wild host plants and are causing serious defoliation. In some localities the achemon sphinx (P. achemon) is also reported as causing damage.

#### PAINTED LADY (Cynthia cardui L.)

Colorado. G. M. List (May 23): On May 10 the painted lady butterfly appeared in large numbers in a number of localities in the State. Many reports came in of their abundance on fruit blossoms. Rainy weather during the past week has reduced their activity, but whenever the sun appears they are out in numbers.

Idaho. C. R. Wakeland (May 31): This butterfly has been reported to be quite numerous in Teton County but is only fairly numerous now. I have noted them in flight as far north as Dubois. I think that this is the species that defoliated some of the native shrubs in the vicinity of Sandpoint last year.

Utah. G. F. Knowlton (May 20): Migrations of the painted lady butterfly were observed on numerous occasions during the first 3 weeks of May and even earlier. Inquiries concerning it and reports of its movements have been received from Provo, Ogden, Richfield, Eureka, and Garland. Northward and westward movements of large numbers of the adults have been observed in various parts of Box Elder, Weber, Davis, and Salt Lake Counties.

#### MONARCH BUTTERFLY (Danaus menippe Hbn.)

District of Columbia. J. A. Hyslop (May 10): Saw an adult in flight in the streets of Washington today.

Florida. H. T. Fernald (May 20): Monarch butterflies appeared at Orlando about November 8, 1934, and soon became abundant. They did not appear to be much faded or battered. On November 13 they were still in a migrating body 20 miles west of Brooksville where they were feeding on the staminate flowers of groundselbush (Raccharis halimifolia). Though cold weather--down to 20° F. or even lower--came on December 12 and 13, the butterflies were frequently seen during last December and January at Orlando and on the east coast, but during February and March almost none were seen. On April 1 I found several near Saint Johns River and caught three, all of which proved to be males. They were of normal size and fresh. Other observers also saw them just about this time. All captured were males.



A CABBAGE BUTTERFLY (Pieris monuste L.)

Florida. J. R. Watson (May 21): The native cabbage butterflies were very abundant during the month. Along the eastern coast they collected in large swarms which attracted the attention of motorists. From Titusville south the migration was southward along the coast. From Jacksonville they are reported to be moving northward.

H. T. Fernald (May 20): On April 22 a distinct direction of flight through the city of Orlando to the southwest was observed. The flight began about April 10 and continued until about the 25th.

WHITE GRUBS (Phyllophaga spp.)

Maryland. J. A. Hyslop (April 27): The first adults of the season were collected at a light on my farm at Avenel, near Silver Spring, on April 27. The flight was so heavy as to interfere with a motion-picture performance in Silver Spring. The following species were collected: P. fervida Fab., 17 males and 9 females; P. fusca Froel., 1 male and 1 female; P. fraterna Harr., 4 males; and P. tristis Fab., 11 males. (Det. by R. Luginbill.)

West Virginia. F. W. Craig (May 28): June bugs have been reported as damaging the leaves of the oak trees in the vicinity of Lewisburg. We had an outbreak of this insect in Greenbrier Valley last year.

Virginia. R. A. St. George (May 10): A heavy emergence of P. fervida adults occurred over most of Arlington County during the last few days of April and the first week of May. Cool, rainy weather interrupted the emergence of the beetles. Adults were so abundant on the warmest nights that over 1,500 specimens were taken in less than 2 hours while they were feeding and mating. The beetles emerged at dusk and fed on privet, pussy willow, maple, and Jack rose.

South Carolina. R. A. St. George (May 10): Activity was not noted in the vicinity of the State Forest Nursery, Georgetown, S. C., until the first week in April. Adults of P. ulkei Smith were taken at that time. By the middle of the month other species such as P. luctuosa Horn, P. fosteri Burm., and P. micans Knoch were taken. The beetles were quite abundant by the end of the month.

Michigan. R. Hutson (May 23): May beetles are appearing in Grand Ledge, Ludington, Muskegon, and Lake Odessa.

Wisconsin. E. L. Chambers (May 21): White grubs are very abundant in La Crosse and Vernon Counties. The beetles were very abundant in Racine and Walworth Counties on one warm night, but cold weather has held them in check later than usual.

Minnesota. A. A. Granovsky (May 24): The expected flight of brood A June beetles was somewhat delayed on account of the cold spring, but it came on

with a rush. The first beetles were observed flying this year on May 1 in Houston County in southeastern Minnesota. They began to fly en masse on May 7. In the vicinity of Saint Paul the first beetles were observed on May 6, although one was taken on April 26. The mass flight started on May 10, but was interrupted by the cold weather. P. fusca is the major species so far. P. tristis and P. rugosa Melsh. are just beginning to fly.

Iowa. C. J. Drake (May 23): June beetles, Brood A, are just beginning to appear in moderately large numbers.

Missouri. L. Haseman (May 22): Backward weather has delayed flights of June beetles. Only a few have come to lights at Columbia.

Kansas. H. R. Bryson (May 25): The flight of May beetles began about May 1 but, owing to continued rainy weather and cool days and nights during the first half of May, comparatively few adults have come to lights.

M. W. Sanderson (May 12): A list of the species taken thus far this year in Douglas County, in the order of their first appearance at lights or at host plants, includes: April 24, P. rubiginosa Lec., P. venemens Horn, and P. futilis Lec.; May 7, P. fervida; May 11, P. fraterna; May 12, P. crenulata Froel., P. hirtiventris Horn, P. crassissima Blanch., and P. hirticula Knoch. In addition to this list, two specimens each of P. fusca and P. horni Smith have been taken from plowed ground, the former species on April 29, the latter on March 20.

#### A WHITE GRUB (Ochrosidia immaculata Oliv.)

Nebraska. M. H. Swenk (May 20): White grub activity in lawns of two Lancaster County residents was reported on April 28 and May 13, respectively.

Illinois. C. L. Metcalf (May 26): Larvae occur at a frequency of 3 or 4 per square foot in gardens at Urbana.

#### GREEN JUNE BEETLE (Cotinis nitida L.)

Tennessee. J. Milam (April): This pest has been found in two tobacco plant beds and in a number of gardens, causing considerable injury.

#### WIREWORMS (Elateridae)

Massachusetts. A. I. Bourne (May 21): Wireworms recently collected in a field of potatoes in Northampton were attacking seed potatoes and were badly riddling some of the seed. In some instances it was possible to take as many as a dozen out of a single seed piece. This is the second year that this plot has been cultivated from grass. (Det. by J. A. Hyslop as Limonius sp.)

South Carolina. C. F. Rainwater (April): Wireworms, Aeolus sp., possibly



dorsalis Say, were found eating cotton seed and reducing stands in the vicinity of Florence.

Florida. J. W. Ingram (April 30): An unusually heavy outbreak of Melanotus sp. occurred in the sugarcane fields of the Lake Okeechobee section. Infestations ranged from a small amount of injury to a 50-percent loss of stand, with an estimated average loss of 4 percent of the crop. Injury was reported to have begun in February, was at its height in March, and was diminishing in April.

Tennessee. G. M. Bentley (May 22): Wireworms occur in unusual numbers throughout the State.

Mississippi. C. Lyle (May 23): On May 3 a correspondent at Mize sent to us specimens of Horistonotus uhlerii Horn, with a report that these insects were damaging the roots of young corn. On May 7 a correspondent at Gunn wrote us that they had caused considerable damage to cotton and corn roots on the same piece of land during the past 3 years. These were the first complaints received regarding this species in many years.

South Dakota. H. C. Severin (May 21): Reports of damage to corn, wheat, barley, and rye are beginning to arrive in our offices in unusual numbers. Damage reported from areas both east and west of the Missouri River.

Nebraska. M. H. Swenk (May 20): Wireworms were reported on April 27 as having taken the wheat in the lower and moister part of a field in Lincoln County.

Washington. M. C. Lane and H. P. Lanchester (April 23): Very general flights of adults of Phaletes canus Lec. have occurred on warm days for 2 weeks. The emergence has been largely composed of male beetles. Female emergences have increased rapidly in number during the past few days. (May 21) Injury by P. canus is heavier than usual at this season. Numerous instances of injury to overwintering onions have been reported, while spring-planted onions, lettuce, and carrots have been severely injured.

Oregon. M. C. Lane and H. P. Lanchester (April 23): A general flight of adults of Limninus infuscatus Mots. was observed in the truck-farming areas along the Columbia River, in northern Multnomah County, during the past week. From 4 years' observations of the beetle flights, it appears that the infestation by this species is steadily increasing throughout this area.

#### A CHINCH BUG (Blissus hirtus Montd.)

Ohio. J. S. Houser (May 17): The bugs are moving about and many are copulating. During the first half of May, a mortality estimated at 75 percent occurred at Cleveland. This was caused by a fungus, probably Sporotrichum globuliferum.



CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

HESSIAN FLY (Phytophaga destructor Say)

Indiana. W. B. Noble, H. R. Painter, and C. M. Packard (May 17): Light to heavy infestations of the hessian fly have been noted in both sown and volunteer wheat near La Fayette, the spring brood now being in the larval stage, with egg laying apparently about over. In one sample of volunteer wheat 84 percent of the stems were infested. Weather conditions this spring have been rather favorable to fly activity.

Illinois. C. Benton (April 27): Numbers of females were observed laying eggs in a winter-wheat field near Sterling.

Missouri. L. Haseman (May 22): In a few of the southeastern counties early seeding of wheat for fall and winter pasture has caused a definite building up of the hessian fly, and some fields show severe damage.

Oklahoma. C. F. Stiles (May 21): The hessian fly is appearing in much larger numbers in northeastern Oklahoma than it has for the past several years. In some fields the infestation will run as high as 10 percent.

CHINCH BUG (Blissus leucopterus Say)

New Hampshire. L. C. Glover (May 24): Overwintering chinch bugs are reported at Hopkinton. They are plentiful at this point and are all of the long-winged form.

Ohio. T. H. Parks (May 25): We have completed a survey of chinch bugs in volunteer timothy clumps taken at random along roadsides in 21 counties. More bugs were found overwintering in such clumps than in other hibernating places. From 40 to 80 clumps were examined in each county and the bugs were counted in the laboratory. The following figures represent the number of adult bugs present per square foot of timothy, listed by counties: Champaign, 7; Clark, 45; Defiance, 8; Erie, 15; Hancock, 67; Henry, 22; Licking, 27; Madison, 7; Marion, 24; Medina, 75; Portage, 23; Putnam, 9; Richland, 56; Sandusky, 20; Seneca, 51; Stark, 40; Van Wert, 18; Wayne, 54; Williams, 10; Wood, 49; Wyandot, 47. On May 24 practically none of the bugs had left their hibernation quarters and no records of chinch bugs in flight had been observed. The weather has been unusually cool for May. Numerous rains came between May 3 and 18 but this has not promoted the development of the fungus Sporotrichum globuliferum among the overwintering bugs in timothy clumps. We expect a heavy infestation this summer, but wheat is well along and will not be seriously damaged.

Indiana. J. J. Davis (May 25): The continued unfavorable wet weather and the rank growth of small grains has, undoubtedly, made the situation very questionable. Notwithstanding these unfavorable conditions, there is reason to believe that the danger is not over by any means and that, if

conditions from now on are favorable, we may expect plenty of bugs. Perhaps in much of the area very heavily infested in 1935, the infestation will decrease, although it still constitutes a serious hazard. There is reason to believe that there will be an increase in some of the areas lightly infested in 1934.

Illinois. W. P. Flint (May 20): It has rained nearly every day during May, but this period of rainy weather has not greatly reduced the numbers of adult bugs. There are still large numbers in the small-grain fields and an outbreak threatens should the weather turn dry. Because of the heavy growth of small grain, the bugs cannot damage this crop nearly so much as they did last year.

Wisconsin. E. L. Chambers (May 21): A chinch bug survey now under way has revealed many overwintering bugs, but not as great numbers as had been anticipated, possibly owing to cold, cloudy weather for the past 2 weeks.

Iowa. C. J. Drake (May 23): About 50 percent of the chinch bugs are in small grain and the rest are scattered in the grass fields. Migration from hibernating quarters to small-grain fields has been very slow and often interrupted. Unseasonably cool weather has interfered with spring migration. The bugs are still migrating on warm days. Winter mortality was quite high in central Iowa. In some districts farmers are reporting considerable numbers of chinch bugs in small-grain fields.

Kansas. W. T. Emery (May 25): There appear to have been three periods this spring when chinch bugs were moving from winter quarters to feeding and breeding fields in the vicinity of Manhattan. Judging from the catch on flight screens, about one-third of the bugs were on the wing on March 25 and 26. About two-thirds of those remaining took wing on April 22 to 23, and the remainder after the first week in May. From one to three bugs have been found per linear foot of drill row of wheat in fields adjoining Andropogon meadows and sorghum stubble. Very few eggs have been found in the field.

Missouri. L. Haseman (May 22): Most of the chinch bugs had left winter quarters by the 10th of May, but examination of wheat fields showed very few where we expected great numbers on May 16. Three weeks of continuous rain has given them a definite set-back, so far as normal breeding is concerned.

Oklahoma. F. A. Fenton (May 22): A survey has just been completed in three of the six counties that were most heavily infested with the chinch bug last fall, and the pest is found to be sufficiently abundant in 18 percent of the small-grain fields to warrant barrier construction, provided the weather turns off hot and dry. Examinations in March at Stillwater showed the pest to be less numerous in this vicinity than at any time in the last 4 years. Owing to the cool, rainy weather the bugs have not yet started the production of the first generation.



C. F. Stiles (May 21): Chinch bugs are showing up in moderately large numbers in Tulsa, Osage, and Okfuskee Counties. Heavy rains have fallen over part of this territory and we do not know yet just what the situation will be.

GREEN BUG (Toxoptera graminum Rond.)

Georgia. O. I. Snapp (May 8): J. R. Thomson, Jr., reports the green bug as abundant and damaging Austrian field peas at Perry.

Colorado. G. M. List (May 23): We are having a few reports of the green bug on grain in southeastern part of the State. Indications are that the injury will not be serious.

BLACK GRAIN-STEM SAWFLY (Trachelus tabidus Fab.)

Ohio. J. S. Houser (May 11): Overwintered larvae kept out of doors under natural conditions at Wooster have begun to transform to the pupal stage.

ALFALFA

PEA APHID (Illinoia pisi Kalt.)

Michigan. R. Hutson (May 20): C. C. Mullett, county agent at Fremont, Newaygo County, reports an infestation of pea aphid in alfalfa.

Mississippi. G. I. Worthington (May 23): On May 21 I observed severe and general infestations of the pea aphid in Bolivar County, on winter peas planted for cover crops. In many places from 10 to 25 percent of the peas had been killed. The severe damage was in fields that had not been plowed under by May 1. Some injury on English peas and alfalfa was also observed but the damage to these crops was not severe.

Kansas. H. R. Bryson (May 25): The pea aphid is quite plentiful in garden peas and may be found in alfalfa fields, although not in sufficient abundance to cause damage.

Nevada. R. A. Blanchard (May 14): Severe damage to alfalfa was observed on May 14 near Reno, Wadsworth, Fernley, and Fallon. A large percentage of the fields near Fernley were severely damaged. The damage, although severe, is not nearly so widespread as in 1934. The infestations developed about a month later than last year. The loss in the infested fields will probably be greater this year than in 1934, owing to the lateness of the infestation.

Washington. L. P. Rockwood (May 2): This species was estimated to average from 16,000 to 20,000 aphids per 100 sweeps in one alfalfa field near Mabton that had been well irrigated and showed no damage. Natural enemies, including a fungous disease caused by Empusa planchoniana, hymenopterous parasites, coccinellid larvae and adults, and syrphid larvae and adults were present in numbers and the parasites and predators were increasing



rapidly. Alfalfa in a field fall sown to barley, near Walla Walla, also showed a large population of aphids. In some fields the percentage of alates in the population had already risen to 25 percent. Coccinellid beetles were moderately abundant, particularly near the foothills of the Blue Mountains.

Oregon. L. P. Rockwood (May 17): The pea aphid increased greatly in some fields of Austrian winter field peas that were seeded late in September and early in October 1934. One field near Barlow showed a damaging population on May 17. There probably will be some very localized damage. The backward spring, cool and with deficient precipitation in May, has been favorable to aphid increase. (May 18): Most of the vetch sown in August and early in September was plowed under for green manure in fields and orchards by May 15. In some localities this vetch had been very heavily infested and some alates had moved out before it was plowed under. Later sown vetch in seed and hay fields as a rule show only small aphid populations and these populations are increasing more slowly than those on Austrian peas.

#### ALFALFA WEEVIL (Hypera postica Gyll.)

Colorado. G. M. List (May 23): The alfalfa weevil promises to do very noticeable injury in Mesa and Delta Counties.

Utah. C. J. Sorenson (May 20): The alfalfa weevil is moderately abundant in Cache and Bear River Valleys.

Utah and California. G. I. Reeves (May 17): Alfalfa weevil larvae were collected at Willits, Mendocino County, Calif., on April 23 and at Hornbrook, Siskiyou County, on May 2. We are also in receipt of specimens collected at Moapa, Clark County, Nev., on April 14, which is also a new record for the occurrence of this weevil. (Det. by A. G. Boving.)

California. A. E. Michelbacher (May 21): Larval populations in the Pleasanton area have been the lowest of any year since our investigation of this pest was started. No counts as high as 1,000 larvae per 100 sweeps of an insect net have been collected. In this area Bathyplectes curculionis Thoms. has built up at a tremendous rate since its introduction. In the field where it was first liberated at least 80 percent of the large alfalfa weevil larvae collected on May 15 were found to be parasitized. On May 2 in a field located some little distance from the point of introduction 15 percent of the large larvae collected were found to be parasitized.

#### CLOVER LEAF WEEVIL (Hypera punctata Fab.)

Ohio. T. H. Parks (May 25): This insect has been very abundant in some clover and alfalfa fields in the northern half of the State. Reports from Huron County reveal that one field of clover was plowed under because of the work of the weevil. Samples were also received from Portage County with the statement that it was seriously injuring alfalfa and clover.

Indiana. J. J. Davis (May 25): The clover leaf weevil was reported on May 14 and 15 to be damaging clover in the northern third of the State. Some specimens showed the white-mold fungous disease and, as the weather continued wet and no further reports of abundance were received, it is assumed that natural control checked the outbreak.

Michigan. R. Hutson (May 20): The clover leaf weevil has been reported from Hartford on sweetclover and from Centerville on red clover.

Washington. E. J. Newcomer (May 21): Larvae of this weevil have been particularly numerous on alfalfa in the lower Yakima Valley this spring. It is possible that this is the result of the two mild winters here. (Det. by G. I. Reeves.)

California. A. E. Michelbacher (May 21): On May 6 the clover leaf weevil was found in fair abundance in Humboldt County. The exact location was about 6 miles east of Garberville. To my knowledge this is a new locality for this insect.

#### SUGARCANE

##### SUGARCANE BORER (*Diatraea saccharalis* Fab.)

Florida. J. W. Ingram (April 30): The sugarcane borer infestation in the Everglades sugar section was less than 0.5 percent at this time.

##### LESSER CORN STALK BORER (*Elasmopalpus lignosellus* Zell.)

Florida. J. W. Ingram (April 30): The growing points of about 4 percent of the sugarcane plants in the Lake Okeechobee district had been killed by lesser corn stalk borers. Injury in some fields ran as high as 30 percent. Nearly all of the injured plants were suckering out, as the point of injury was high enough in the plant to permit this. There will be little loss of stand, although the delayed growth will result in somewhat lowered sugar content in the injured stalks. Only slight injury was found in cane fields at Fellsmere and at Quincy.

##### SUGARCANE BEETLE (*Euethiola rugiceps* Lec.)

Georgia. T. L. Bissell (May 11): Young corn in several gardens in one part of Griffin was severely attacked and corn 18 inches high was killed.

Alabama. J. M. Robinson (May 24): The rough-headed cornstalk borer is reported as attacking corn in Ranburne.

Mississippi. C. Lyle (May 23): Inspector M. D. Peets reports having observed injury to corn and sugarcane at several places in the southwestern section of the State. A correspondent at Rome, Sunflower County, sent us specimens of these beetles on May 9, with a report that his stand of corn had been ruined.



Louisiana. J. W. Ingram and W. E. Halev (May 15): Beetle injury to sugarcane in the section west of the Atchafalaya River is the lightest in several years. Injury has been less than 30 percent of that in an average year. Timely rains in the infested area have increased the growth of cane so that it is out of danger of serious injury.

#### RICE

##### SUGARCANE BEETLE (Euetheola nigiceps Lec.)

Louisiana. W. A. Douglas (May 29): A survey of the southwestern Louisiana rice belt has been made to obtain data on the extent of injury to rice by the sugarcane beetle. Six thousand stalks were examined in 12 fields and the percentage of killed plants found to be 3.3. Fifteen hundred of these stalks, or 3 fields, were in the Kinder-Oberlin section, where the percentage of killed plants was 5.8. Most rice fields have now been flooded and no more sugarcane beetle injury will occur, except on planted levees, until the rice is drained for harvest.

##### RICE STINKBUG (Solubea pugnax Fab.)

Louisiana. W. A. Douglas (May 29): Rice stinkbugs are breeding rapidly on various wild hosts in the Louisiana rice section, the favorite wild host being Paspalum urvillei.

##### RICE WATER WEEVIL (Lissorhoptrus simplex Say)

Louisiana. W. A. Douglas (May 29): Rice water weevils are present in about average numbers in the Louisiana rice section. Adult feeding scars are noticeable on a few small areas, but aside from this there is no apparent injury to the rice crop.

#### F R U I T I N S E C T S

#### APPLE

##### CODLING MOTH (Carpocapsa pomonella L.)

New York. P. J. Parrott (May 20): Indications point toward large populations of codling moth in western New York.

Delaware. L. A. Stearns (May): On April 30, 65 percent of overwintered larvae had transformed. The spring-brood moths first emerged on May 5.

Pennsylvania. H. N. Worthley (May 28): A single moth emerged from an observation cage at Biglerville on May 14, and in 5 bait pails on May 18 only one moth was taken. Continued cool weather delayed further activity until May 23, when 7 moths emerged and 6 were caught in the pails. In 1934 the heaviest moth flight occurred between May 18 and 24, when 476 moths were trapped in 5 bait pails in the same block of trees.



South Carolina. W. C. Nettles (May 27): Codling moth below normal in commercial orchards.

Ohio. T. H. Parks (May 25): From a cage of over 1,000 overwintering larvae at Columbus, only 2 moths have emerged. These emerged on May 22. Emergence is fully 10 days behind that of 1934. The cool weather has held back the moth and the first brood of larvae will probably be bunched and more easily controlled with well-timed sprays. Emergence in Lawrence County, southern Ohio, began on May 8 but has been progressing very slowly. Many are now in the pupal stage and will emerge as soon as warm weather arrives. Nights have been too cool for moth activity in southern counties.

Indiana. J. J. Davis (May 25): Reports from Vincennes and Orleans indicate that pupation was not uncommon on April 11, in fact newly formed pupae were observed as early as March 27 at Elberfeld (between Vincennes and Evansville). At Vincennes the first moths were captured in the orchard on May 8 (4 days later than in 1934). No eggs hatched at Orleans up to May 23. Apparently hatching of the first-brood worms will be rather drawn out.

G. W. Hamilton (May 20): At Orleans the first adults were captured in bait traps during the night of May 8, and in light traps during the night of May 9. Since then daily captures in both light and bait traps gradually increased through the night of May 13. Since May 13 weather conditions have been very unfavorable for moth activity.

L. F. Steiner (May): Bait traps began capturing moths at Bicknell and in 2 orchards at Vincennes on the night of May 8. Emergence began in packing sheds at Bicknell and Elberfeld, also on May 8. The first pupal skins were observed in the orchard on May 9, the last previous search for them having been made on May 7. If any emergence occurred before May 8, rain and low temperatures would have prevented oviposition. First-brood larvae are expected to begin hatching in this area on May 18, if the weather is normal.

Illinois. W. P. Flint (May 20): Codling moth adults began emerging in southern Illinois about May 1. Quite a heavy emergence occurred from May 10 to 15.

Missouri. L. Haseman (May 22): Emergence of the codling moth began the last part of April in the southeastern part of the State, from May 1 to 3 in the southwestern part, and from May 8 to 11 in the central part. Up to May 20 none had emerged in the northern part. Cool, rainy weather has slowed down emergence and development, so no worms have yet been observed entering fruit.

Colorado. G. M. List (May 23): The winter mortality of codling moths was low. Moth emergence began in Mesa County on May 18. No moths have yet emerged in Delta County. The spring is backward, a contrast to that of last year.

Idaho. R. W. Haegele (May 1): Codling moth emergence has not yet started. The season is nearly normal, the calyx spray being due about May 10, at which time emergence should be under way.

Washington. E. J. Newcomer (May 21): Moths began emerging on May 3 in the Yakima Valley.

EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

New England. L. H. Worthley (May 6): In New Hampshire hatching was first observed on April 26. An apparently heavy infestation is reported in the Concord district. Massachusetts inspectors first observed signs of hatching on April 22. Cool weather kept the larvae near the egg masses until a warm spell on April 30, when they began to spin tents. Reports from Quincy, Boston, Framingham, and Lynnfield indicate heavy infestations in these districts. Hatching of larvae was noted in the Westerly and Newport, R. I., districts on April 26. A heavy infestation exists in the Westerly section. Connecticut inspectors report hatching as having begun in the Middletown district on April 20, in Willimantic territory on April 25, and in the vicinity of Manchester on April 27. All three of the latter sections are apparently heavily infested.

Maine. H. B. Peirson (May 17): The American tent caterpillar is general in the southwestern part of the State. The tents are becoming very noticeable in size and abundance.

New Hampshire. L. C. Glover (May 24): The tent caterpillar is very common in certain localized areas around Durham. As a whole, however, the State has fewer caterpillars than last year. Several men from different parts of the State have noted wilt disease among the caterpillars.

Vermont. J. M. Robinson (May 25): Extremely abundant in the southwestern section of the State, comparatively scarce to moderately abundant in central and northeastern sections, and the smallest numbers where winter temperatures were coldest.

Massachusetts. J. V. Schaffner, Jr. (May 21): The eastern tent caterpillar is unusually abundant in many localities throughout the eastern part of the State.

Rhode Island. A. E. Stene (May 20): The eastern tent caterpillar is showing up in unusual numbers.

Connecticut. W. E. Britton (May 23): Caterpillars and their nests are extremely abundant on apple and wild cherry throughout the State.

New York. P. J. Parrott (May 20): Very abundant in western New York and in the Hudson Valley.

R. E. Horsey (May 22): At Rochester very common on ornamental crabapples of several species, native crabapples, and several species of



cherry. On May 9 the nests measured about  $2\frac{1}{2}$  inches in diameter and the caterpillars were nearly  $\frac{1}{2}$  inch long.

New Jersey. T. J. Headlee (May 21): The tent caterpillar is extraordinarily abundant over the State, perhaps as abundant or more so than at any time during the last 20 years.

M. Kisliuk, Jr., and E. Kostal (May): The American tent caterpillar is especially abundant from Monmouth County to Cumberland County. Eggs began to hatch the second week in April. Trees infested, in order of severity, are wild cherry, apple, native plum, Japanese quince, and flowering thorn.

Pennsylvania. H. N. Worthley (May 24): Eastern tent caterpillars are now becoming full grown and are beginning to wander. During a trip on May 21 to 23, complete defoliation was observed common from Centre County east to Lehigh County and south to Adams County.

West Virginia. F. W. Craig (May 22): Eastern tent caterpillars have been very numerous in localities scattered throughout the State.

Virginia. F. F. Smith (June 3): In Arlington County the damage by the tent caterpillar this year appeared to be limited to groups of trees and on which defoliation was complete and the nests were numerous. In nearby areas the damage was slight on the same hosts and the nests were scarce.

Ohio. E. W. Mendenhall (May 14): M. americana was found to be quite prevalent in Cuyahoga County this spring.

Kentucky. W. A. Price (May 27): The tent caterpillar was conspicuous in many places in Kentucky during the early part of May, being especially abundant in the eastern part of the State.

Tennessee. J. Milam (April 15): Many trees at Clarksville are entirely defoliated but little damage has been done to orchards.

#### FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

Connecticut. P. Gorman (May 22): Larvae began hatching about the first week in May in New Haven County. In the more heavily infested orchards it appears to be well in control.

New York. P. J. Parrott (May 20): Orchards with severe infestations, especially in the Hudson Valley, are more common than in any recent year.

N. Y. State Coll. Agr. News Letter (May): Leaf rollers started hatching the last week in April in the Hudson River Valley and the first week in May in western New York. Some damage was observed in the Hudson River Valley later in the month.



Pennsylvania. H. E. Hodgkiss (May 21): In the northern half of the State the fruit tree leaf roller has been more abundant than in other years.

PISTOL CASE BEARER (Coleophora malivorella Riley)

Pennsylvania. H. E. Hodgkiss (May 21): A rather serious infestation of the pistol case bearer was observed in Adams County. The case bearers were practically matured on May 17.

DUSKY LEAF ROLLER (Amorbia humerosana Clem.)

Pennsylvania. H. E. Hodgkiss (May 21): Leaf rollers, especially the dusky leaf roller, were very abundant in all stages throughout the State during the week of May 13 to 18.

A CUTWORM (Septis alia Guen.)

New Jersey. T. J. Headlee (May 21): We had a most extraordinary number of this noctuid moth on the wing during the latter part of April and the first part of May. Reports on this insect have been received from various parts of the State, particularly from middle and southern parts, where the larvae are beginning to appear in apple orchards where they are mistaken for green fruit worms.

GREEN FRUIT WORM (Graptolitha antennata Walk.)

Connecticut. P. Garman (May 22): Green fruit worms abundant in pear and apple orchards. Eggs observed about a month ago.

New York. N. Y. State Coll. Agr. News Letter (May): The green fruit worm began hatching in the Hudson River Valley the last of April and by the end of May was doing some damage in the lower part of the valley.

APHIDS (Aphidae)

Connecticut. P. Garman (May 22): The rosy aphid (Anuraphis roseus Baker) is present in many orchards in New Haven County but weather conditions have not been suitable for its development and consequently it is not abundant at present.

Ohio. T. H. Parks (May 25): No reports of trouble from the green aphid (Aphis pomi DeG.) or the rosy aphid (Anuraphis roseus Baker) in our State. The apple grain species (Rhopalosiphum prunifoliae Fitch) migrated from trees at Columbus about a week ago.

Indiana. J. J. Davis (May 25): In orchards where aphids were abundant earlier, they have been reduced to insignificance by ladybeetle larvae.

New York. P. J. Parrott (May 20): The rosy apple aphid is moderately abundant in western New York.

N. Y. State Coll. Agr. News Letter (May): All species of fruit aphids were appearing in western New York by the end of April. The apple grain aphid was leaving the apples by the third week in May. The green apple aphid was only moderately abundant over most of the State. The rosy apple aphid was generally reported as scarce until the end of May, when it started to increase in abundance in the Hudson River Valley and also in the lakes district.

Pennsylvania. H. E. Hodgkiss (May 21): Rosy apple aphid infestation is not important. In three southwestern counties there are enough rosy aphids to cause a rather serious situation if breeding conditions are favorable.

Michigan. R. Hutson (May 20): Apple aphids have been frequently reported from southwestern Michigan, but all specimens examined proved to be R. prunifoliae.

Wisconsin. C. L. Fluke (May 22): Apple aphids numerous.

Minnesota. A. G. Ruggles (May): On May 20 H. C. Tederson, of Lowry, Winona County, reported aphids numerous on buds of some fruit trees. A. Campbell, Lewiston, Winona County, reported apple aphids very abundant earlier in the season.

Arkansas. D. Isely (May 24): The rosy apple aphid is unusually abundant in northwestern Arkansas.

Idaho. R. W. Haegle (May 1): The green apple aphid is quite general in apple orchards of southwestern Idaho but severe injury is not anticipated.

#### WHITE APPLE LEAFHOPPER (Typhlocyba pomaria McAtee)

Connecticut. P. Garman (May 22): White apple leafhoppers are scarce at present.

Pennsylvania. H. E. Hodgkiss (May 21): Pale leafhopper nymphs were hatching in Bucks County and other southeastern counties on May 14.

#### A TREEHOPPER (Glossonotus crataegi Fitch)

New York. P. J. Parrott (May 20): This treehopper is very abundant in a few apple orchards in the vicinity of Hilton.

#### SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (May 20): Predators have greatly reduced the San Jose scale infestation in Fort Valley. This locality was more heavily infested last fall than in average years. Very few live scales have been left in some orchards. A few crawlers set up during the last month.

Indiana. J. J. Davis (May 25): San Jose scale is evidently noticeably increasing in northern Indiana. A number of scale-encrusted twigs have been received.

Wisconsin. E. L. Chambers (May 21): The spraying of about 600 city properties in southern Wisconsin has been completed under favorable weather conditions.

ROSE CHAFER (Macrodactylus subspinosus Fab.)

South Carolina. F. Sherman (May 27): Rose chafer locally abundant and doing damage in unsprayed apple orchards in the mountains.

Tennessee. G. M. Bentley (May 22): A very phenomenal outbreak of the rose beetle in three commercial orchards in Fayetteville has caused considerable excitement. The owners report from 50- to 85-percent loss of apples from the heavy attack of these beetles. They seem to congregate in the woods and fly in swarms to the orchards.

APPLE FLEA WEEVIL (Orchestes pallicornis Say)

Ohio. J. S. Houser (April 29): During the past few years this insect has increased in abundance in a considerable number of areas in the State. One grower who operates a 30-acre commercial orchard at Medina states that a conservative estimate of his loss during each of the last 8 years is \$1,000. On April 26, when this orchard was visited, one fruit cluster that had not reached the prepink stage, was infested with 13 weevils. This was very unusual; however, on many clusters groups of 3, 4, and 5 beetles were found.

SAY'S BLISTER BEETLE (Pomohopoea sayi Lec.)

Ohio. J. S. Houser (April 29): This beetle appeared in large numbers in Millersburg and New Philadelphia and caused serious damage by eating all parts of the blossoms. The damage is most severe in the tops of the trees. The beetles are active on warm, sunny days and retire to the shelter of debris under the trees during rainy, cool weather.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Delaware. L. A. Stearns (May): First overwintered adults emerged from hibernation on April 25; peak of emergence on May 2.

Virginia. W. J. Schoene (May 25): During the past 30 days adults have been reaching the peach orchards in very much larger numbers than in previous years.

Pennsylvania. H. E. Hodgekiss (May 21): Plum curculio was very abundant in Adams, Franklin, and other southern counties during the week of May 13.



Ohio. E. H. Parks (May 25): Inspection of apple orchards indicates that there are fewer of these beetles than usual in the apple trees. It is difficult to find curculio-scarred apples, except where fruit trees join woodland or weedy fence rows. The large peach crop in prospect is still free from curculio blemishes.

Illinois. W. P. Flint (May 20): Largely because of the extreme drought of last year, the plum curculio is very scarce. S. C. Chandler's examinations in southern Illinois show the insect in smaller numbers than at any time during the last 10 years.

Georgia. O. I. Shann (May 20): The peak of emergence of first-brood larvae from drops occurred on April 28 at Fort Valley. The first pupation of the season was recorded on May 9, which is 19 days earlier than the first pupation in 1934. The insect is developing from 2 to 3 weeks earlier than last year and a serious second brood is expected. Peach drops were very heavily infested with curculio larvae. (May 21): The first transformation to adult beetles in soil in the laboratory was recorded today. It will probably be another week or two before these beetles emerge. Several new-lookng beetles were among the curculios jarred from peach trees in an orchard today. (May 28): The first new beetle of the season emerged today from the soil in the laboratory. This is 16 days earlier than the first emergence last year, and on account of the unusually early emergence of first generation adults there is every prospect of considerable damage to the peach crop from second-brood larvae. There was a marked increase in the number of curculios caught in the orchard by jarring this morning, as a result of the emergence of new beetles from the soil. In one block of trees this increase was 246 percent during the last week. (May 31): The first-generation adults started emerging from peach drops during the night, following a rain yesterday.

South Carolina. W. C. Nettles (May 27): Curculio apparently above normal in peach orchards.

Mississippi. C. Lyle (May 23): Heavy damage to unsprayed peaches and plums by the plum curculio is rather general over the State.

Missouri. L. Haseman (May 22): Plum curculio seems to be less abundant than usual, or else is being held back by weather. Few punctures in plums have been reported at Columbia, and at Cape Girardeau some stings during the past 2 weeks have been reported.

Kansas. H. R. Bryson (May 25): Some cherries at Manhattan show both feeding- and egg-laying punctures of this insect.

#### CAMBIUM CURCULIO (Conotrachelus anaglypticus Say)

Georgia. O. I. Shann (May 17): A few specimens have been taken since April 20 by jarring peach trees at Fort Valley.

PEACH BORER (Aegeria exitiosa Say)

Georgia. O. I. Snapp (May 15): The examination of hundreds of peach trees in commercial orchards in all directions from Fort Valley during the last month shows that there has been no cocooning or pupation of this insect under field conditions. (May 22): The first cocoon of the season was found in a peach orchard today. It contained a pupa about 2 days old. This is the earliest pupation in the field of which we have a record. (June 3): The first moth of the season, a normal, full-sized female, emerged today from a cocoon collected in a commercial peach orchard at Fort Valley on May 22. This is the earliest moth emergence from commercial orchard material in this locality of which we have a record.

Illinois. W. P. Flint (May 20): More than the usual number of inquiries concerning damage by the peach tree borer have been received this spring.

LESSER PEACH BORER (Aegeria pictipes G. & R.)

Delaware. L. A. Stearns (April 26): Reports of injury from Millsboro and Bridgeville.

Georgia. O. I. Snapp (May 17): Spring-brood moths are still emerging at Fort Valley.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (May): Ninety percent of the overwintered larvae had transformed by April 30; first emergence of spring-brood moths occurred on April 26; heavy emergence of spring-brood moths took place from April 26 to May 2. First first-brood eggs observed on May 9.

New Jersey. G. J. Haeussler (May 24): The first adult moths were captured in bait pans on April 26.

Georgia. O. I. Snapp (May 20): Twig injury is less abundant than usual at Fort Valley.

Ohio. T. H. Parks (May 25): Larvae were present in the new growth on May 2 and were causing wilting of some terminals.

Indiana. J. J. Davis (May 25): Oriental fruit worm adults were observed in a packing house at Bedford on April 25. Emergence was slow because of cool weather. At present, twig injury is common in southern Indiana and worms half grown or older are to be found.

L. F. Steiner (May): The first twig injury by the oriental fruit moth was observed at Vincennes on May 9.

Illinois. W. P. Flint (May 20): Damage to peach twigs from the oriental

fruit moth is now beginning to show over the southern fourth of the State.

Mississippi. C. Lyle (May 23): On April 26 Inspector J. P. Kislenko sent to us photinia twigs showing injury evidently caused by this insect. Complaints of damage to peach twigs have been received from various localities throughout the State.

Arkansas. D. Isely (May 24): The oriental fruit moth has been rare in northern Arkansas.

#### GREEN PEACH APHID (Myzus persicae Sulz.)

Nebraska. M. H. Svenk (May 20): Reports of injury to peach trees were received from Lancaster and Cedar Counties on May 9 and 12, respectively.

Colorado. G. M. List (May 23): The green peach aphid is more numerous in the peach areas than for a number of years. Spraying has been quite general and with the large number of ladybeetles that are appearing it is hoped little damage will be done.

#### BLACK PEACH APHID (Anuraphis persicae-niger Smith)

Maryland. E. M. Cory (May 7): Black peach aphid reported at Cambridge.

#### LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Georgia. O. I. Snapp (May 22): This species is unusually abundant this year at Fort Valley and is damaging peaches by puncturing the fruit and sucking the juice.

#### PEAR

#### PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. P. Garman (May 22): The pear psylla is reported more abundant than last month in New Haven County.

New York. P. J. Parrott (May 20): Pear psylla abundant in western New York.

#### PEAR MIDGE (Contarinia pyripora Riley)

New York. P. J. Parrott (May 20): Pear midge abundant in western New York.

#### PEAR THRIPS (Taeniothrips inconsequens Uzel)

New York. N. Y. State Coll. Agr. News Letter (May): The pear thrips caused some damage during the month in Ulster, Columbia, and Otsego Counties; in general, however, it was less numerous than last year.



Oregon. D. C. Mote (May): Few larvae still remaining on prune and cherry trees. Most remaining thrips are mature.

California. H. J. Ryan (April 25): Several growers in Antelope Valley have applied control measures for thrips on pear.

PEAR LEAF BLISTER MITE (Eriophyes pyri Pgst.)

California. H. J. Ryan (April 25): The pear leaf blister mite has been quite active in the Antelope Valley and pear buds have been discolored. Several growers have applied control measures.

PLUM

RUSTY PLUM APHID (Hysteroneura setariae Thos.)

Missouri. L. Haseman (May 21): The rusty brown plum aphid was reported serious on some varieties of plums in the central part of the State early in May, but is largely cleared up now.

Mississippi. C. Lyle (May 23): Plum twigs showing a heavy infestation of rusty plum aphid were received from a grower at Shuqualak on April 30 and Inspector J. Milton stated that he found a heavy infestation on a plum tree in Jackson on April 29.

Oklahoma. F. A. Fenton (May 22): Aphids of various species are causing more trouble this year than normally, owing to the cool, late spring. The rusty brown plum aphid has caused considerable damage to plums.

Texas. F. L. Thomas (April and May): Many of the plum trees of Bee and Live Oak Counties are infested. Reports were received from Skidmore on April 29, from Three Rivers on May 11, and from Rockwall on April 22.

CURRENT

CURRENT APHID (Myzus ribis L.)

Indiana. J. J. Davis (May 25): Current aphid reported very abundant at Marion on May 21.

North Dakota. J. A. Munro (May 21): Aphids very abundant on currants in Fargo.

Nebraska. M. H. Swenk (May 20): The current aphid was reported working on gooseberry leaves in Garfield County on May 9.

PECAN

PECAN LEAF CASE BEARER (Acrobasis juglandis Le B.)

Georgia. J. B. Gill (May 22): The larvae of the pecan leaf case bearer have been causing considerable damage to the buds and foliage in some pecan orchards in the vicinity of Tifton.

FALL WEBWORM (Hyphantria cunea Drury)

Georgia. O. I. Shapp (May 24): Nests of young fall webworms were observed on pecan trees at Fort Valley today. This is unusually early for the first seasonal appearance of these insects. Another heavy infestation is expected. Last year's infestation in some localities was the heaviest I had ever seen.

J. B. Gill (May 22): Nests of the fall webworm are now showing up in pecan orchards and other trees in the vicinity of Tifton.

Mississippi. G. L. Bond (May 23): On May 10 a large web of fall webworms was noted on a persimmon tree near Wade. The worms appeared to be about half grown.

PECAN PHYLLOXERA (Phylloxera devastatrix Perg.)

Mississippi. C. Lyle (May 23): On May 7 county agent L. C. Strahan, of Natchez, reported heavy infestations of galls on pecan trees in that vicinity.

A SAWFLY (Periclista sp.)

Mississippi. H. Gladney (May 23): Sawfly larvae, Periclista sp., have caused considerable injury to pecan trees along the coast of Jackson County during the past month by eating holes in the foliage. The leaves have the appearance of having been shot with a shot gun. (This is probably P. hickoriae Rohw., according to notes on file in the Insect Pest Survey.)

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (May 21): Citrus aphids were very abundant the first part of April, which was very much later than usual. They were chiefly on trees that had been more or less injured by the freeze of December and were putting out new growth. The ladybeetle, Leis sp., was found in large numbers in the northern part of Orange County and was effecting commercial control of aphids.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Gyll.)

South Carolina. W. J. Reid (May 14): The vegetable weevil has been discovered at Charleston. (Det. by L. L. Buchanan.)

Georgia. T. L. Bissell (May 4): Potatoes are heavily infested by weevils in a farm garden at Orchard Hill. (May 6): I have found L. obliquus at five points in and near Orchard Hill and Milner, over an area 5 miles by 4. We have scouted six other counties, one or two localities to the county, in a ring around the area, without finding further infestations. (Det. by L. L. Buchanan.)

California. A. C. Fleury (April 30): The vegetable weevil has been found in Santa Ana Canyon about half a mile across the Riverside County line and so far as I know this is the only place where it occurs in Riverside County. It was found there on wild growth and is far away from any vegetable-growing area.

D. T. Frendergast (May 27): On May 15, the vegetable weevil was observed seriously injuring tomatoes 11 miles south of Tracy, across the line in Stanislaus County. This is the first record of the appearance of this weevil in this area.

A CAMEL CRICKET (Dalmanella brevipes Hald.)

Oklahoma. C. F. Stiles (May 21): The California camel cricket has been reported damaging gardens and truck crops in Kingfisher, Garfield, and Tillman Counties. This insect was reported in 1932 as being present in large numbers in Harmon County. Since then it has again been reported from Harmon, Ellis, Roger Mills, and Jackson Counties. It has been definitely proved that this insect feeds on vegetation.

MOLE CRICKETS (Scapteriscus spp.)

North Carolina and South Carolina. W. A. Thomas (May): Mole crickets, S. acletus R. & H., and S. vicinus Scudd., have been serious pests in tobacco seed beds throughout the South Carolina tobacco belt, which includes several border counties in North Carolina. Although isolated instances of injury have been noted during the past 2 years, this is the first time the mole cricket has been considered a serious seed-bed pest in this particular territory.

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Iowa. C. J. Drake (May 23): Many scattered reports of damage to seed corn, melon, and other seeds have come in this spring. The maggot is fairly common in the onion-growing districts of eastern Iowa.



Missouri. L. Haseman (May 22): Many complaints are being received. Melon growers in southeastern Missouri are reporting injury.

Utah. G. F. Knowlton (May 14): Seed corn maggots are damaging melon and bean seeds in several parts of Weber County.

### POTATO AND TOMATO

#### COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Virginia. H. G. Walker (May 25): The Colorado potato beetle has been unusually abundant in many sections of Tidewater Virginia. This is probably due to the fact that many growers failed to control this insect properly last year because of the low price of potatoes.

Georgia. J. B. Gill (May 22): The Colorado potato beetle has been damaging Irish potatoes and tomatoes in the vicinity of Tifton.

Florida. F. S. Chamberlin (May 20): The Colorado potato beetle is very abundant in Gadsden County, where it is causing considerable damage to tomato plants.

Ohio. B. J. Landis and H. C. Mason (May 23): The Colorado potato beetle is very abundant at South Point. Some eggs have hatched. On May 20 many egg masses were washed off the plants by heavy rains.

Tennessee. G. M. Bentley (May 22): In western Tennessee the Irish potato beetle is occurring in larger numbers than usual.

Alabama. J. M. Robinson (May 24): The Colorado potato beetle has been very abundant and active this year at Auburn. Stiretrus anchorago Fab. has appeared associated with the larvae.

Mississippi. C. Lyle (May 23): Damage to Irish potatoes is quite general over the State. In some places eggplants and tomatoes are also being injured.

Utah. G. F. Knowlton (May 14): The Colorado potato beetle appears to be rather scarce this spring in the small infested area in Weber and Davis Counties.

#### POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Virginia. L. D. Anderson (May 1): Although the potato plants are just coming through the ground, flea beetles may be found easily throughout every potato field in the vicinity of New Church.

North Dakota. J. A. Munro (May 21): Potato flea beetles are moderately abundant at Fargo. Adults were commonly observed in gardens this spring.

South Carolina. W. C. Nettles (May 27): Potato flea beetles are more than normally abundant over the State. They are injuring eggplant and potato seriously.

CORN EAR WORM (Heliothis obsoleta Fab.)

Georgia. J. B. Gill (May 22): The tomato fruit worm has been very troublesome in tomato fields at Tifton.

South Carolina. C. O. Bare (May 18): Examination of 355 stalks in a field of sweet corn showed 88 stalks, or 25 percent, infested with from one to three larvae per stalk.

Mississippi. C. Lyle and assistants (May 23): Tomato fruit worms are beginning to damage tomatoes in the districts around Ocean Springs, Moss Point and Brookhaven. These insects severely injured the young growth and buds on roses in Pascagoula early in May.

Kansas. H. H. Walkden (May 25): One adult was taken at the Hays trap light on May 2, the first appearance of the insect this season. At Manhattan the first adult was taken at the trap light on May 19 and another on May 24. All were badly rubbed. None have been observed in the field.

Texas. F. L. Thomas (May 20): Moths were beginning to oviposit on tomatoes on May 14, just as the plants were beginning to bloom. Eggs or newly hatched larvae were apparently dislodged by heavy rains and wind during the following week, as on May 20 only now-laid eggs were found.

S. W. Clark (May 4): This insect is more abundant than usual on corn and tomato at Weslaco. It is seriously damaging pop corn.

BEANS

MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

Correction.--The record of the Mexican bean beetle in Mississippi by E. W. Dunnam, in the Insect Pest Survey Bulletin, May 1, 1935, p. 86, is erroneous. The specimen has been determined as E. borealis Fab.

Maryland. L. W. Brannon (May 3): The first Mexican bean beetle of the season was found feeding in the field on the Eastern Shore at Salisbury on May 3. A large number of field examinations were made in the vicinity and only one beetle was found.

Virginia. L. W. Brannon (April 29): The first beetle of the season was found feeding in the field in the Norfolk area on April 29. Only one beetle was found on 25 rows of beans, so the beetle is apparently one of the first to emerge. Daily observations have been made since April 18. On the Eastern Shore of Virginia the first beetle was found feeding in the field on May 1 near Belle Haven.

H. G. Walker (May 25): About 20 percent of the overwintering beetles have emerged from our hibernation cages at Norfolk.

South Carolina. F. Sherman (May 27): The Mexican bean beetle is becoming active in the field.



Georgia. T. L. Bissell (May 27): The Mexican bean beetle is very injurious in Union County, much more so than around Experiment. The damage has been by beetles, which are just beginning to lay eggs.

Ohio. H. F. Howard (May 25): The first record of the Mexican bean beetle in the field was made at South Point on May 8. H. C. Mason found the first feeding in the field at Columbus on May 13. The beetles have been emerging in hibernation cages throughout the month and the peak of emergence occurred on May 21 at Athens and Columbus.

Alabama. J. M. Robinson (May 24): The Mexican bean beetle is active generally over the northern two-thirds of the State.

New Mexico. R. L. Wallis (April): Examinations of hibernation cages for the period ended April 30 in the foothills of the Estancia Valley showed that 67.71 percent of the beetles were dead. This is 5.68 percent lower winter mortality than the average for the past 5 years.

#### BEAN LEAF BEETLE (Corotoma trifurcata Forst.)

Virginia. L. W. Brannon (May 1): The first bean leaf beetles were observed feeding on young snap beans in the field at Norfolk on April 25. This is 10 days earlier than this insect was observed feeding in the field in 1934. Considerable damage was being done in some patches of beans.

South Carolina. W. C. Hettles (May 27): Bean leaf beetle damage is above normal over the State.

Georgia. J. B. Gill (May 22): The bean leaf beetle and the spotted cucumber beetle have been troublesome on the foliage of beans this spring at Tifton.

Ohio. H. C. Mason (May 20): Not as abundant at South Point as in 1934.

Mississippi. C. Lyle (May 23): On April 30 a correspondent at Potts Camp sent specimens with a report that garden beans were being severely injured by them. Additional reports of damage were received from Copiah and Lincoln Counties.

#### SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

Virginia. L. W. Brannon (May 1): Twelve-spotted cucumber beetles were observed feeding in the field at Norfolk on young snap beans for the first time this season on April 26. This is 3 days later than the first beetles were observed feeding in 1934.



BANDED FLEA BEETLE (Systema tenebriosa Say).

Virginia. L. W. Brannon (May 1): Adults were observed feeding on snap beans in the Norfolk area on April 26. Considerable damage was being done to the young plants in some counties.

CABBAGE

CABBAGE INSECTS (Lepidoptera)

South Carolina. W. J. Reid and C. O. Bare (May 24): Listed according to relative abundance, the chief cabbage insects in the vicinity of Charleston are the diamond-back moth (Plutella maculipennis Curt.), the cabbage looper (Autographa brassicae Riley), the imported cabbage worm (Ascia rapae L.), and the cabbage webworm (Hellula undalis Fab.). The total infestation of these insects in an experimental planting increased from less than 0.5 worm per plant on partially headed cabbage on April 20 to 13.68 worms per plant on headed cabbage on May 24. Only 3 of the last-named species were found on May 6 to 3 in an examination of 7,200 plants.

IMPORTED CABBAGE WORM (Ascia rapae L.)

Ohio. R. H. Davidson (May 20): The cabbage butterfly is depositing eggs in numbers on early cabbage in the vicinity of Clyde.

B. J. Landis (May 23): Imported cabbage worms are present on early cabbage at Columbus. A few eggs had hatched by May 1.

Mississippi. N. D. Peets (May 23): Injury to cabbage has been more severe this year in the trucking sections of Copiah and Lincoln Counties than in recent years.

California. R. E. Campbell (April 25): Cabbage worms have been sufficiently numerous in several cabbage fields at Puente and Temple City to require the application of insecticides.

DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker (May 25): The secondary parasite reared from Angitia hellulae Vier., the parasite attacking the larvae of the diamond-back moth, has been identified by A. B. Gahan as Eupteromalus viridescens Walsh.

Georgia. J. B. Gill (May 22): The diamond-back moth has been quite common in cabbage fields in the Tifton district.

Utah. G. F. Knowlton (May 14): Diamond-back moths are very abundant in most districts of northern Utah. Larvae of all sizes are abundant on Sophia sophia, Norta altissima, Cheirinia repanda, and other mustards near fields that will soon be planted to cabbage and other crop host plants.

HARLEQUIN BUG (Murgantia histrionica Hahn)

- Virginia. L. W. Brannon (May 1): Adult harlequin bugs have been observed feeding on seed-kale plants in the field at Norfolk since April 5. The first eggs were found in the field on April 26. No hatching has been observed to date. The date of emergence and oviposition this season is about normal.
- Georgia. J. B. Gill (May 22): Harlequin cabbage bugs have been occurring in damaging numbers on cabbage in the vicinity of Tifton.
- Ohio. B. J. Landis and H. C. Mason (May 23): Harlequin bugs were very numerous on mustard greens at Columbus. One field showed from slight to moderate damage. A few egg masses were present on May 20.
- Kentucky. W. A. Price (May 27): The harlequin bug has appeared at several places in the State, notably at Marion, Hopkinsville, and Lexington.
- Mississippi. C. Lyle (May 23): Inspector G. I. Worthington, of Cleveland, reports having observed scattered infestations of the harlequin bug on cabbage and turnips. A heavy infestation of these bugs on turnips was reported recently from Marshville.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

- Georgia. J. B. Gill (May 22): The onion thrips has been quite prevalent in onion patches at Tifton.
- Mississippi. G. L. Bond (May 23): On May 4 I noted severe damage to onions at Leakesville. The tops had turned yellow and appeared to be almost dead.

HORSERADISH

HORSERADISH FLEA BEETLE (Phyllotreta armoraciac Koch)

- Michigan. R. Hutson (May 7): Heavy infestations of horseradish plantings at Saint Joseph, in Berrien County, are reported.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

- Delaware. L. A. Stearns (April 26): Report of early activity from Bridgeville.
- Virginia. L. D. Anderson (May 1): In many fields in the New Church district the strawberry weevil, commonly called the "strawberry clipper", is causing losses as high as 50 percent of the setting berries.

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus L.)

Utah. G. F. Knowlton (May 24): From 50 to 85 percent of the strawberry root weevils found in Salt Lake and Utah Counties had pupated.

A FLEA BEETLE (Haltica sp.)

Iowa. C. J. Drake (May 23): The strawberry flea beetle (Haltica sp.) has been reported as extremely abundant in strawberry fields at Keokuk. Plants are being severely damaged by this insect.

Oregon. D. C. Mote (May): Flea beetles are showing up on strawberry at Corvallis. More numerous than usual.

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Utah. G. F. Knowlton (May 24): Moths are very abundant in strawberry patch in Cache County, but only moderately abundant in most fields examined in Box Elder, Davis, Weber, Salt Lake, and Utah Counties.

A NEGRO BUG (Thyreocoris sp.)

Virginia. L. D. Anderson (May 1): Several hundred of these "negro bugs", Thyreocoris sp., were found on plants and on the ground in areas about 2 feet across, and several such spots were found in one strawberry field at New Church. Together with red spiders they were causing the death of the plants in these small areas.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (May 21): The most striking event in entomology during the month was the discovery of the pepper weevil in Manatee County. Searching revealed its presence in nearly every pepper field in the county, but none in adjoining counties. Damage to the spring crop of peppers is not great as yet, but in some of the fields carried through the winter the loss is 100 percent.

SUGAR BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. G. F. Knowlton (May 14): Beet leafhoppers have now moved into sugar beet fields in Box Elder and Weber Counties. They have not become abundant in any fields examined. Most of the specimens taken have been pale females.



TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula Fab.)

Florida. F. S. Chamberlin (May 20): The tobacco flea beetle continues to be unusually scarce in Gadsden County this season.

Tennessee. J. U. Gilmore (April): Considerable damage has been done by this pest to tobacco plant beds at Clarksville.

TOBACCO BUDWORM (Heliothis virescens Fab.)

Florida. F. S. Chamberlin (May 11): The tobacco budworm is more abundant in Gadsden County than usual for this period.

TOMATO WORM (Phlagothontius sexta Johan.)

Florida. F. S. Chamberlin (May 11): Small hornworm larvae are becoming very abundant in tobacco fields in Gadsden County.

A TOBACCO MOTH (Ephestia elutella Hbn.)

Virginia. W. D. Reed (May 31): During the first week in May when the traps were put into operation at Richmond, only 3 tobacco moths (E. elutella Hbn.) were captured. This small number indicates that the emergence of the spring brood was just beginning. The number of moths caught each week has risen rapidly, a total of 5,226 having been recorded for the week ending May 24. It is thought that this moth is nearing the peak of the spring-brood emergence.

TOBACCO THRIPS (Frankliniella fusca Hinds)

Florida. F. S. Chamberlin (May): Heavy rains have reduced the thrips population very materially in Gadsden County.

## COTTON INSECTS

### BOLL WEEVIL (Anthonomus grandis Boh.)

- South Carolina. F. F. Bondy (May 9): The boll weevil was found feeding on young cotton at Florence today. In 1934 the first weevils were found in the fields on May 21. Weevils are more abundant than in 1934 and about as numerous as in 1933.
- Georgia. J. B. Gill (May 22): Adults have been prevalent in cotton fields for some time at Tifton. Control measures are being carried out in some fields.
- Alabama. J. M. Robinson (May 24): The boll weevil is moderately abundant in the cotton fields in central and southern Alabama.
- Mississippi. H. C. Young (May 18): Boll weevils, at the rate of 42 per acre were found in three or four fields examined in Forrest County.
- Louisiana. M. T. Young (May): Boll weevils were fairly numerous in fields of large cotton near favorable hibernation quarters in the vicinity of Tallulah on May 11. R. C. Gaines reports that fewer weevils emerged from hibernation cages up to May 18 than at any time during the past 4 years.
- Oklahoma. C. E. Stiles (May 21): The number of active boll weevils observed in hibernation cages up to April 30 were much less than in 1934. In 1934 a total of 237 active weevils were observed up to this same date out of 28,000 installed. On the same date in 1933, 13 live weevils were observed out of 35,000. In 1935, only 8 were observed out of 25,000. The weather remains cold and cotton has made poor progress. Much of it will have to be replanted. It appears quite likely that few weevils have survived the past winter in Oklahoma, except in the extreme southeastern part of the State. This fact, together with the lower population present in the fields last fall, means that comparatively few weevils will be present in the cotton fields early the coming season.
- Texas. F. L. Thomas (May 23): In 1934 we had next to the highest percentage of emergence of boll weevils for 10 years, with very little injury to cotton during the season. This year the indications are that we shall have a very low emergence, if not next to the lowest, and an opportunity to see the results, following a very wet May.
- R. W. Moreland (May): An average of 1 boll weevil to 58 plants on upland cotton, and 1 to 64 plants on bottom land, near timber, in the vicinity of College Station was reported on May 11. No weevils were found on bottom-land cotton at a greater distance from timber. K. P. Ewing and R. L. McGarr found no weevils in fields examined in Calhoun and Victoria Counties on May 18.

### THURBERIA WEEVIL (Anthonomus grandis thurberiae Pierce)

- Arizona. T. P. Cassidy (February 20): An annual examination is made in a field of cotton grown for experimental purposes at Tucson, to determine the number

of weevils produced during the season from a known number of weevils introduced into the field, and also the number of weevils that hibernated in the field. The examination of the 1934 crop was made from January 2 to 7, 1935. A total of 5,196 bolls were collected, 4,054 from the plants and 1,142 from the ground. From these bolls 121 weevil stages were found and 82, or 67.77 percent, were alive. A total of 170 weevil cells were found and 49 were empty. It was found that 2.79 percent of the bolls from the plants contained weevil cells or stages and 2.45 percent of the bolls from the ground were infested. Although this examination shows that the percentage of live weevils present is normal, the weevil population produced in the field is below normal, as compared to the population produced in the same field since 1926. Another examination showed that the infestation was below normal in the 1934 crop, as compared to the infestation records kept in the same field since 1930. The comparatively low infestations in domestic cotton in 1934 is attributed to drought in southeastern Arizona during the growing season and to an abnormally low weevil population in *Thurberia* plants in the mountains. Surveys made in four mountain ranges in southeastern Arizona during January and early February show that the weevil population present in *Thurberia* plants is normal. This indicates that a normal weevil infestation may be expected in domestic cotton plantings in southeastern Arizona this year, provided rainfall is normal during July and August, affording sufficient moisture to release the weevils from their pupal cells.

#### CUTWORMS (Noctuidae)

Texas, Arizona, and Mexico. R. E. McDonald (May 13): L. B. Coffin reports that cutworms are doing considerable damage to the field cotton in the Presidio section of Texas, but so far they have not damaged the trap-plot cotton. Some of the farmers intend to use poison, but in any case it will be necessary to replant some of the fields. The worms are also doing some damage on the Mexican side, and one ranch will have to replant about 40 acres. S. D. Smith writes that cutworms are very numerous in the Tucson, Ariz., district this year, and that some replanting will be necessary.

Texas. K. P. Ewing and R. L. McGarr (May 24): Considerable injury to young cotton by cutworms in the vicinity of Port Lavaca was reported during April and early in May. Most of the material submitted was determined tentatively as *Agrotis ypsilon* Rott., and *Feltia malefida* Guen., although many of the specimens were abnormal and many represent closely related species. Included with the cutworm specimens were a few specimens of *Heliothis obsoleta* Fab. and *Prodenia* sp. (probably a very dark form of *P. ornithogalli* Guen.). (Det. by C. Heinrich.)

#### SALT-MARSH CATERPILLAR (*Estigmene acrea* Drury)

Texas. R. L. McGarr (May 24): The salt-marsh caterpillar caused considerable damage to young cotton in Calhoun County in April. (Det. by C. Heinrich as dark specimens of *E. acrea*.)



COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. K. P. Ewing and R. L. McGarr (May 23): First leaf worms of the season were found on cotton 5 miles south of Port Lavaca in Calhoun County today. Four worms were found, three webbing to pupate. (Det. by C. Heinrich.) (June 1): Leaf worms have been found in Calhoun, Victoria, Refugio, and Brooks Counties. This insect was found in two new fields in Calhoun County this week.

APHIDS (Aphididae)

South Carolina. C. F. Rainwater (May 1): Three species of root lice, the white cotton root louse (Trifidaphis phaseoli Pass.), the green cotton root louse (Anuraphis maidi-radiciis Forbes), and the brownish-purple cotton root louse (Rhopalosiphum sp.), have been found on cotton at Florence and a great deal of damage is resulting from them. They are much more numerous than they were last year. There is hardly a field in this immediate vicinity where the cotton is up that is not infested by one or more species of root louse. As was true last year, the white cotton root louse is more abundant in this immediate vicinity than either of the others and is causing most of the damage at the present time.

W. C. Nettles (May 27): The cotton root aphid has been reported from the eastern half of the State.

THRIPS (Thysanoptera)

Egypt. A. H. Rosenfeld (May 9): The principal entomological feature here for April was the prevalence of the cotton thrips in vast areas of all provinces during the abnormally cool first half of the month. The attack was particularly general in the Delta and the province of the Fayoum, an oasis-like area about 35 miles southwest of Cairo, being especially severe on early planted crops. It subsided with the exceptionally hot weather of the fine week of April and at the beginning of May was difficult to find. In some areas 50 percent replanting was necessary.

COTTON FLEA HOPPER (Psallus soriatus Reut.)

Texas. K. P. Ewing and R. L. McGarr (April): Hatching of cotton flea hoppers from overwintering eggs began at Port Lavaca on February 19. The emergence was light, however, during February and the early part of March, with the peak of emergence occurring from April 6 to 8. During April 38,595 nymphs emerged, as compared to 22,887 from similar cages last year. Cotton plants collected last September averaged 251 nymphs per 100 plants, whereas those collected from October 6 to November 3 averaged 1,226 per 100 plants. Flight screens to determine migration of flea hoppers were placed in operation on April 16 and during the remainder of the month an average of 36.6 flea hoppers were caught per screen. The corresponding figures were 6.5 in 1934 and 102.5 in 1933. (May 25): Flea hopper infestation continues to remain comparatively light at Port Lavaca. No heavy migration into cotton during week. Infestation increasing rapidly on weed host plants, especially

on horsemint. Horsemint is more abundant this year than during the past 2 years.

F. L. Thomas (May 23): The hatching or emergence of flea hoppers from croton weeds prior to May 16 was slightly greater than the average, but the number emerging per 100 weeds during the first 2 weeks of May exceeds that of any other year since 1925.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Mexico. C. S. Rude (May 28): Infestation is very light at Tlahualilo, Durango, less than 1 percent in squares. No bolls are yet available for examination.

BEET ARMYWORM (Laphygma exigua Hbn.)

Arizona. W. A. Stevenson (May 24): Reports of May 18 indicate that considerable loss has recently been caused to the young cotton in the Tucson district. The caterpillars feed principally on the seed leaves of the cotton but in rare instances feed on the buds and stems, killing the young plants. Where the leaves are destroyed and the buds kept intact, the plants will undoubtedly recover if irrigated. However, the cotton will be set back about 2 weeks. Approximately 200 acres of cotton have been replanted in the Tucson district owing to the ravages of these worms, and the majority of the farmers have given their cotton an extra early irrigation to help it recover. Similar damage has been reported from the Salt River Valley, especially from the western part.

Texas. A. J. Chapman (May 24): Reports of May 18 state that cutworms have injured young cotton considerably during the past week. It is estimated that about 100 acres of cotton was replanted in the vicinity of Presidio because of cutworm injury. Severe infestations have been noted in several alfalfa fields. Farmers are trying various methods of control--irrigating, poisoning, and cultivating. (Det. by C. Heinrich.) (June 1): Parasites are exercising considerable control. In one alfalfa field under observation large numbers of dead parasitized worms were found. It is doubted that this armyworm will cause further damage in this area this year.

California. R. E. Campbell (May 1): The beet armyworm is rather abundant on sugar beets in the El Monte district, requiring the application of baits in a number of fields. Stands were so reduced in several untreated fields that beets were plowed up.

S. Lockwood (May 24): The beet armyworm has been responsible for some



rather severe but local loss to cotton growers in Kern and Tulare Counties. Last week it seemed that a considerable quantity of cotton in that area would be destroyed, but for reasons unascertained almost the entire population of worms has been killed.

Mexico. C. S. Rude (May 28): Considerable damage is being done at Tlahualilo, Durango, by a larva very much like the beet armyworm (L. exigua).

## FOREST AND SHADE - TREE INSECTS

### PERIODICAL CICADA (Magicicada septendecim L.)

North Carolina. Z. P. Metcalf (May 25): The 17-year locust has been reported from Vienna, Forsyth County, and Pinay Creek and Laurel Springs, Alleghany County, and from Surry County. (June 4): I have just returned from the northwestern part of the State and I have found them at the following places: North of Mount Airy and at Dobsons, in Surry County; northwest of State Road in Wilkes County; near Roaring Gap, in both Wilkes and Alleghany Counties; near Sparta, Whitehead, and Twin Oaks in Alleghany County; in Ash County; west of Deep Gap in Watauga County; and in western Wilkes County west of the Yadkin River.

R. W. Leiby (June 3): The periodical cicada was present in Watauga and Wilkes Counties late in May.

Virginia. W. J. Schoene (May 25): The 17-year locust is appearing in Augusta County west of Staunton, and in Roanoke, Franklin, and Wythe Counties.

H. G. Walker (May 25): The newspapers in Norfolk report that the cicadas are appearing in great abundance in the southwestern part of the State.

Z. P. Metcalf (June 4): The periodical cicada has been reported from the following Counties: Wythe, Pulaski, Montgomery, Roanoke, Franklin, and Pittsylvania.

West Virginia. F. W. Craig (May 28): The periodical cicada was reported on good authority as emerging at White Sulphur Springs on May 22.

### GIANT APHID (Longistigma caryae Harr.)

West Virginia. F. W. Craig (May 28): This is one of the outstanding pests of the month. It has been observed on sycamore and linden in Charleston and Huntington. Several people have complained of the honeydew dripping from the trees.

### FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Mississippi. E. W. Gemmer (May 10): The forest tent caterpillar is defoliating red and blackjack oak, dogwood, red gum, and black gum in Pearl River County.



Louisiana. T. E. Snyder (May 10): The forest tent caterpillar is general and abundant in northern Saint Tammany Parish and eastern Washington Parish, feeding principally on black gum and red gum. The oaks are little touched. There have been complaints of extensive defoliation of shade trees in Bogalusa.

#### CANKER WORMS (Geometridae)

Connecticut. W. E. Britton (May 23): Larvae of Alsophila pometaria Harr. are now abundant around New Haven and are feeding on deciduous trees.

Connecticut and New York. E. P. Felt (May 23): The fall canker worm is developing in numbers in southwestern Connecticut and southeastern New York, especially on the margins of areas badly infested last year.

Ohio. T. H. Parks (May 25): Fall canker worms in more than usual numbers are feeding on elm foliage on the grounds of one of the country clubs near Columbus.

Iowa. C. J. Drake (May 23): Undetermined species of canker worms are abundant in orchards and timbered areas in the southern half of the State, where considerable damage is being done.

Missouri. L. Haseman (May 25): Light infestations of canker worms are occurring in some orchards. The larvae are about full-grown.

#### GYPSY MOTH (Porthetria dispar L.)

Vermont. H. L. Bailey (May 25): A high percentage of hatch was observed in a colony at Vernon, in Windham County, on May 22.

General. A. F. Burgess (May): The first hatching of gypsy moth egg clusters took place slightly earlier this year than in 1934. In the Pennsylvania infested area the first hatching was on April 27. This is several days earlier than last year. In a number of towns immediately east of Greenfield, Mass., first hatching occurred on May 1, 3 days earlier than in 1934. Up to the middle of May hatching was extremely variable, with many clusters just beginning to hatch on the latter date and many others not started. The larvae from the first clusters that hatched remained clustered on and around the masses from which they had come for periods up to a week or 10 days.

#### SALMON FLY (Taeniopteryx pacifica Bks.)

Idaho. J. C. Evenden (May 23): Every spring this insect appears on the foliage of deciduous trees and shrubs on the shore of Occur d'Alone Lake, being quite numerous for a few days and causing considerable damage.

WALNUT SCALE (Aspidiotus juglans-regiae Comst.)

New Jersey and West Virginia. E. P. Felt (May 23): The English walnut scale was found in some numbers on white oak twigs at Englewood, N. J., and in very injurious numbers on soft maples at Charleston, W. Va.

BIRCH

BRONZE BIRCH BORER (Agrilus anxius Gory)

Pennsylvania. E. P. Felt (May 23): The bronze birch borer was found to be abundant in a birch in the environs of Philadelphia.

BOXELDER

BOXELDER APHID (Periphyllus negundinis Thos.)

West Virginia. F. W. Craig (May 28): This is one of the outstanding insect pests of the month, having been reported as abundant in Charleston and Huntington and also in lesser abundance in Beckley and Bluefield.

CYPRESS

A SAWFLY (Tenthredinidae)

California. R. E. Campbell (May 15): Numerous reports of larvae of an undetermined species of sawfly on cypress trees and hedges at Alhambra were received the latter part of April and early in May. (This may be Susana cupressi Rohw., judging from the files of the Insect Pest Survey.)

ELM

A BARK BEETLE (Scolytus multistriatus Marsh.)

New York, New Jersey, and Pennsylvania. F. M. Wadley (May 10): The following records of this bark beetle are being submitted: White Plains and Saint George (Staten Island), N. Y.; Berkley Heights, Bernardsville, Round Brook, Chatham, East Orange Water Reservoir, near South Orange, Flomington Green Village, Griggstown, Highland Park, Lawrenceville, Little Falls, Madison, Moorestown, Morristown, Nutley, Poquannock, Princeton, and White House, and, although no specimens were obtained, there were traces of infestation at Hopewell, Ridgewood, and Roseland, N. J.; in Fairmount Park in Philadelphia, and at Radnor, Pa.

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Massachusetts. J. V. Schaffner, Jr. (May 21): Many beetles were issuing from hibernation on May 11, and issuance increased considerably on May 16 and 17. The first feeding in the field was noticed at Woburn on May 19.

Connecticut. W. E. Britton (May 23): Hibernating adults at Ansonia, Danielson, Middletown, New Britain, and West Hartford indicate that the beetles have come through the winter successfully.

North Carolina. R. W. Leiby (May 13): Chinese elms used as ornamental shrubs are suffering noticeable injury.

California. Monthly News Bull. Kern County Agr. Comm. (May 3): The first elm leaf beetles were found on April 29. This is 1 month later than the beetles were found last year.

#### ELM BORER (Saperda tridentata Oliv.)

Missouri. L. Haseman (May 22): Adults were taken from cells under the bark of elm trees at Columbia on May 15.

Nebraska. M. H. Swenk (May 20): The elm borer was reported the last week in April as having killed some young elm trees in Gage County.

#### A FLEA BEETLE (Haltica sp.)

Maine. H. B. Peirson (May 20): A very heavy infestation of flea beetles (Haltica sp.) on American elm was observed at Harmony on April 22.

#### EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. P. J. Parrott (May 20): The elm bark scale is apparently becoming more numerous in western New York. The first generation is now present on the trees.

Ohio. T. H. Parks (May 25): The European elm scale is resuming its feeding on American elms in the city parks of Columbus and is quite conspicuous on the lower branches of young trees. This is the most serious elm pest in Columbus.

Utah. G. F. Knowlton (May 14): The European elm scale is damaging elms at Logan and Salt Lake City.

#### EUROPEAN FRUIT LECANIUM (Lecanium corni Bouché)

Oklahoma. F. A. Fenton (May 22): The European lecanium is unusually abundant on elms. Many requests have been received for control measures.

#### HEMLOCK

#### A SAWFLY (Woodiprion tsugae Middleton)

Oregon. F. C. Craighead (April): The sawfly which was discovered in August 1934 heavily defoliating the western hemlocks on approximately 10,000 acres along the slopes of the Cascades in Oregon, has been identified by Wm. Middleton as his newly described species. The defoliated area was revisited this month by R. L. Furness in order to determine the present



status of the infestation and to collect additional information on the life history of the species. It was found that there had been no additional defoliation subsequent to the first examination, that practically no cocoons remained on the twigs, needles, or other exposed places, and that most of the cocoons on the ground were abandoned. No living sawflies were found, except a few overwintering larvae in cocoons. These appeared to be hold-overs from the main emergence of last fall. The conditions of the trees strengthened the belief that but slight timber losses will occur in this area.

A BARK BORER (Melanophila fulvoguttata Harr.)

New York. P. M. Eastman (May 25): The spotted hemlock borer is very prevalent on hemlock in our amusement park known as Briggs Grove in Baldwinsville. This borer has been reported as quite abundant in the vicinity of the Thousand Islands.

LARCH

LARCH CASE BEARER (Coleophora laricella Hbn.)

Maine. H. B. Peirson (May 20): The larch case bearer was observed in the vicinity of Augusta on May 17. The larvae moved into new foliage and were feeding a great deal. The foliage was already becoming grayish but no browning was seen.

Vermont. H. L. Bailey (May 25): Moderately heavy feeding by the larch case bearer was observed on new foliage at Woodstock, Windsor County, and all in Rutland County. Some trees near Rutland that have been infested for several years are apparently dead.

New England and New York. J. V. Schaffner, Jr. (April): The infestation of the larch case bearer still persists, after 3 years, in 10 permanent sample plots located in New England and New York.

OAK

HORNED OAK GALL (Andricus cornigerus O. S.)

Connecticut and New York. E. P. Felt (May 23): The horned oak gall occurs on pin oak somewhat generally in southwestern Connecticut and southeastern New York, occasionally being quite prevalent upon individual trees or groups of trees.

Mississippi. J. Milton (May 9): Galls caused by A. cornigerus are very abundant on water oak trees at Jackson.

WHITE OAK CLUB GALL (Andricus clavulus O. S.)

New Jersey. E. P. Felt (May 23): The white oak club gall is somewhat abundant on a white oak at Englewood.

PINE

PINE BARK APHID (Pineus strobi Htg.)

Wisconsin. E. L. Chambers (May 21): The pine bark louse seems to be very abundant everywhere this spring where white and Norway pine are growing.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Connecticut. E. P. Felt (May 23): The pine leaf scale is generally present on mugho and Austrian pines in particular. A heavy infestation has been noted at Hartford.

Ohio. E. W. Mendenhall (May 14): The pine leaf scale is abundant on Scotch, Austrian, mugho, and other species of pine in Cuyahoga County.

Iowa. C. J. Drake (May 23): The winter mortality of the pine leaf scale is quite high in central Iowa. We found only two living eggs under 400 scales at Ames.

Nebraska. M. H. Swenk (May 20): Spruce twigs infested by the pine leaf scale were sent from Dixon County on April 26.

SCOTCH PINE SCALE (Toumeyella numismaticum Pettit & McDaniel)

Wisconsin. E. L. Chambers (May 21): Jack pine throughout the central part of the State seems quite generally infested with the Scotch pine scale, and in Adams and Juneau Counties many trees have been killed as a result of attack.

SYCAMORE

SYCAMORE SCALE (Stomacoccus platani Ferris)

California. R. E. Campbell (May 15): During the latter part of April and the first part of May numerous complaints were received regarding leather-winged beetles, Cantharis consors Lec., particularly on sycamores at Alhambra. An examination proved that these beetles were feeding on a small coccid, probably S. platani. Although considered a beneficial insect, they proved to be of considerable annoyance in many backyard sycamores. One tree not over 15 feet high was treated. Several square-foot counts of the beetles on the ground under the tree after treatment showed that this comparatively small tree had over 25,000 beetles on it.

WILLOW

EUROPEAN WILLOW BEETLE (Plagiodera versicolora Laich.)

Massachusetts. J. V. Schaffner, Jr. (May 21): Adults of the imported willow leaf beetle were found active on May 12 in Melrose and eggs were noted on the 14th. This species seems to be fully as abundant as last year.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

SOFT SCALE (Coccus hesperidum L.)

New York. R. E. Horsey (January 28): Scale found on leaves of agave and yucca taken from a greenhouse succulent collection in Rochester. The scale appears to be common and spreading.

BARBERRY

BARBERRY APHID (Rhopalosiphum berberidis Kalt.)

Connecticut. W. E. Britton (May 23): Heavy infestation on a Japanese barberry hedge in New Haven.

DELPHINIUM

CYCLAMEN MITE (Tarsonemus pallidus Bks.)

Connecticut. E. P. Felt (May 23): The cyclamen mite is becoming troublesome on delphinium at Stamford.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Wisconsin. E. L. Chambers (May 21): General inquiries are being received for control of the gladiolus thrips, and specimens sent in indicate that many thrips overwintered in storage.

HOLLY

ASH-GRAY BLISTER BEETLE (Macrobasis unicolor Kby.)

Florida. E. W. Berger and G. B. Merrill (May 21): Severely attacked several holly trees (Ilex opaca and I. dahoon) at Paradise near Gainesville. The owner states that this is the fifth successive year these beetles have appeared on his holly.

IRIS

IRIS THRIPS (Bregmatothrips iridis Watson)

New York. F. F. Smith (May 11): The hibernating adults of the iris thrips in a large iris planting in Brooklyn are less numerous than in 1934. The first-generation offspring reached the pupal stage today. Younger larvae were more numerous and the typical rusty appearance of the leaves was becoming evident.



PHLOX

A PHLOX BUG (Lopidea davisi Knight)

Illinois. C. L. Metcalf (May 28): The phlox plant bug (L. davisi) has been reported as very injurious to cultivated phlox at Bone Gap.

REDBUD

REDBUD APHID (Aphis pawneeae Hottes)

Kansas. H. R. Bryson (May 25): The redbud aphid was found on May 6 infesting the larger twigs on a small redbud tree (Cercis canadensis) at Manhattan. This is the first time it has been reported from Manhattan, although it has been learned that one tree on the college campus was infested last year. This occurrence is significant because of the fact that the native redbud has been comparatively free from insect pests. The aphids infest the underside of the twigs.

ROSE

GRAPEVINE HOPLIA (Hoplia callipyge Lec.)

California. H. C. Donohoe (May 8): The grapevine hoplia has appeared in the Fresno area in more than usual spring abundance during the past 10 days. As many as 34 adults have been found feeding on a single rose blossom.

A SCARABAEID (Serica fimbriata Lec.)

California. R. E. Campbell (May 14): Beetles are so numerous on roses and pyracantha at San Gabriel as to practically defoliate them.

SNOWBALL

SNOWBALL APHID (Aphis viburnicola Gill.)

Minnesota. A. G. Ruggles (May 23): The snowball aphid is unusually abundant around Minneapolis and Saint Paul.

SPIRAEA

SPIRAEA APHID (Aphis spiraeicola Patch)

Nebraska. M. H. Swenk (April 20 to May 20): On May 9 a report of the Spiraea aphid working on spiraea plants was received from Garfield County.

TULIP

TULIP APHID (Rhopalosiphoninus tulipella Theo.)

Washington. E. O. Essig (April 24): The aphids were sent to me on November 14, 1934, by J. F. Curry, of the California State Department of Agriculture.

He stated that they were taken from tulip bulbs grown in the State of Washington. I examined the material myself. Only anteroous individuals were collected but fortunately I have some mounted paratypes of this species which appear to be R. tulipella and they compare well.

BULB MITE (Rhizoglyphus hyacinthi Bdv.)

Nebraska. M. H. Swenk (April 20 to May 20): Tulip bulbs infested with bulb mites were received on May 4 from Gage and Saline Counties.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

EYE GNATS (Hippelates spp.)

Florida. E. C. Cushing (May 31): A rather severe outbreak of eye gnats occurred in Orange County early in May.

PUNKIES (Culicoides spp.)

Indiana. J. J. Davis (May 25): On May 16 punkies were reported from La Porte, where they were exceedingly annoying. They first appeared this spring the last of April or the first of May. The correspondent reports that they caused a great deal of annoyance last year.

TROPICAL RAT MITE (Liponyssus bacoti Hirst.)

North Carolina. R. W. Leiby (May 25): The complaint of the tropical rat mite attacking man at Pinehurst is the fourth in the past 12 months from as many points in North Carolina.

BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

South Carolina. W. C. Nettles and F. Sherman (May 27): Many reports of severe poisoning from bites of this spider have been received.

Alabama. J. M. Robinson (May 24): The hour-glass spider has been reported as biting two human beings at Dothan. Both were affected seriously but not fatally.

Mississippi. C. Lyle (May 27): On account of considerable newspaper publicity regarding one or two cases where people had been bitten by L. mactans, there has been a great deal of interest in this spider in all sections of the State and many specimens have been received for identification.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Maryland. E. H. Cory (April 29): Young wood ticks are abundant in low herbage at Public Landing.

CATTLE

SCREW WORMS (Cochliomyia spp.)

Florida. J. R. Watson (May 21): Screw worm damage is on the increase and the complaints are coming from farther south in the State than during the last 2 years. It appears likely that damage will be fully as severe as it has been for 2 years.

General. E. C. Cushing (June 5): W. G. Bruce states that in Florida screw worm cases are increasing rapidly in most counties. Fifteen hundred cases have been reported from Alachua County and the outbreak extends as far south as the Caloosahatchee River and Saint Lucie County. R. A. Roberts states that in Georgia, the outbreak is centered in the south-central counties, with scattered cases as far north as Lincoln County. Total cases reported from the State are 141 in cattle, 109 in hogs, 110 in horses, 12 in sheep, 7 in dogs, and 1 in man. W. J. Spicer reports only light infestations in eastern Texas but the number of cases is increasing.

Texas. H. E. Parisi (May 23): The screw worm has greatly increased in numbers during the past month. About 85 percent of the flies taken in the traps belong to C. macellaria Fab. From a 1-quart sample of flies taken from the status trap operated at Menard, three were C. americana Cushing and Patton.

HORN FLY (Haematobia irritans L.)

Mississippi. C. Lyle (May 23): Inspector G. L. Bond reports that horn flies are rather abundant and are quite annoying to cattle in the vicinities of Moss Point and Pascagoula.

Missouri. L. Haseman (May 22): The horn fly is already abundant and is causing cattle much annoyance.

SHORT-NOSED CATTLE LOUSE (Haematopinus euryesternus Nitz.)

Nebraska. M. H. Swenk (May 20): The short-nosed cattle louse was reported infesting cattle in Hall County on May 8.

BEAVER

BEAVER PARASITE (Platysylla castoris Reitsema)

Michigan. R. Hutson (May 8): On April 16 W. F. Dubbs reported a slight infestation of beaver parasites in Marquette County.



DEER

SHEEP BOTFLY (Oestrus ovis L.)

Washington. H. H. Stage (May 21): The death of 30 or 40 deer, on a game preserve in Pend Oreille County, was probably caused by the sheep botfly late in March and early in April. From 150 to 200 of the larvae were reported to have left the nose of a single deer after its death. All of the animals found dead were yearlings.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Massachusetts. J. V. Schaffner, Jr. (May 21): Three inquiries have been received from near Boston recently regarding termites and the methods of exterminating them from buildings.

Rhode Island. A. E. Stene (May 20): A great many complaints have been sent in regarding damage from termites. These insects have been present in the State for a great many years but reports of damage to buildings have been relatively scarce until this year.

Connecticut. N. Turner and M. P. Zappe (May 23): Reports from the entire State indicate that damage from R. flavipes Kol. is increasing.

Pennsylvania. H. E. Hodgkiss (May 21): Infestations of termites are being reported rather generally throughout the State this spring, on the average three or four inquiries on control practices coming in each week.

Maryland. E. N. Cory (May): Winged females and males taken in house at Oxford on April 25. Termites were reported from Annapolis, on April 26, and from Baltimore, on May 15.

Virginia. H. G. Walker (May 25): We have received quite a large number of calls for information about termites in the vicinity of Norfolk during the past 2 months.

Ohio. H. C. Mason (May 23): Winged termites are abundant in the University section of Columbus.

Indiana. J. J. Davis (May 25): Inquiries regarding termites have been even more numerous than a year ago. We receive more inquiries about this insect than any other one insect, and they come from every part of the State.

Illinois. W. P. Flint (May 20): Reports of damage by termites are being received in much greater numbers than at any time during the last few years. During May, 75 reports of damage were received.

Wisconsin. C. L. Fluke (May 22): Termites reported damaging house foundations at Delavan.

Nebraska. M. H. Swenk (April 20 to May 20): Reports concerning rather severe infestations of termites, R. tibialis Bks., continued to be received during the period here covered.

Kansas. B. Listov (May 11): Quite an outbreak of termites at Wichita this spring.

Texas. F. L. Thomas (May 21): Termites in residences reported from Bynum and Houston.

#### ANTS (Formicidae)

Georgia. M. R. Smith (May 21): Specimens of Camponotus caryae Fitch, Formica pallide-fulva schaufussi Mayr, and Dorymyrmex pyramicus flavus Perg. were sent in from Milner, by T. L. Bissell, who obtained them from the stomach of a yellow-bellied sapsucker. He also sent specimens of Pharaoh's ant (Monomorium pharaonis L.), which he stated were colonized in a bundle of new paper bags.

Alabama. M. R. Smith (May 21): H. Yates, of Fairhope, wrote me that the imported South American fire ant (Solenopsis saevissima richteri Forel.) did considerable damage to cabbage, potato, and satsumas there during February and March. He states that these ants go down below the surface of the ground on cabbage or potato and eat holes in the stalk, often girdling it, causing the plant to fall over.

Mississippi. M. R. Smith (May 21): On April 25 winged males and winged queens of the imported South American fire ant (S. saevissima richteri) were obtained from nests near Agricola by G. L. Bond. On May 14 the first male and queen pupae of the fire ant (S. xyloni McCook) were observed at State College. Tiny black ants, Monomorium minimum Buckl., were reported as very troublesome in a house near Philadelphia. Also on May 14 a correspondent at Greenwood sent in for determination winged queens of the carpenter ant (Camponotus mercilanus pennsylvanicus DeG.).

Texas. M. R. Smith (May 21): F. F. Bibby sent me for determination many winged males and several winged queens of the Texas leaf-cutting ant (Atta texana Buckl.), which were collected at Austin on May 11 by J. M. Del Curto.

#### A PINE SAWYER (Monochamus notatus Drury)

Massachusetts. J. W. Schaffner, Jr. (May 9): A lithograph company in eastern Massachusetts sent in an adult which had bored through from 75 to 100 sheets of paper. This paper was shipped from Maine in large bundles. These bundles were fitted with skids made of cheap pine lumber, and the beetle evidently issued from one of the skids on the side facing the paper.

BLACK CARPET BEETLE (Attagenus piceus Oliv.)

South Dakota. H. C. Severin (May 21): We have had more inquiries and complaints concerning the black carpet beetle this year than in any other year since the organization of the entomological work in South Dakota.

FIG MOTH (Ephestia figulilella Greg.)

California. H. C. Donohoe (May 8): A ptinid, Trigonogenius globulum Solier, has been encountered in small numbers during the present spring in masses of hibernating larvae and webbing of the raisin moth (Ephestia figulilella Greg.) in dry locations beneath ground timbers in open-sided raisin-storage stacks. This appears to be the first record of its occurrence in the Central Valley of California.

A BOOKLOUSE (Psocus sp.)

South Carolina. W. C. Nettles (May 27): An interesting case of lichen removal from old shingles on a house with specimens of Psocus sp. is reported from the central part of the State.



# INSECT PEST SURVEY BULLETIN

Vol. 15

Supplement

No. 4

## INSECT NOTES FROM COSTA RICA IN 1934

C. H. Pallou, Chief of Entomological Section, National Agricultural School, San Pedro de Montes de Oca, Costa Rica

The following tables were prepared from notes sent in each month during 1934 by C. H. Pallou. The dates indicate the time specimens were collected and are not necessarily the period of activity of the insect, nor do the given localities limit the distribution of the species. The notes are arranged by orders and under the families in the larger orders. In order to condense the tables, certain localities are abbreviated as follows:

Muelle = Muelle de San Carlos

Pase Archo = Pase Archo de San Sebastian

Peralta = Peralta y Chitarrin

San Antonio = San Antonio de Belen

San Isidro = San Isidro de Coronado

San Pedro = San Pedro de Montes de Oca

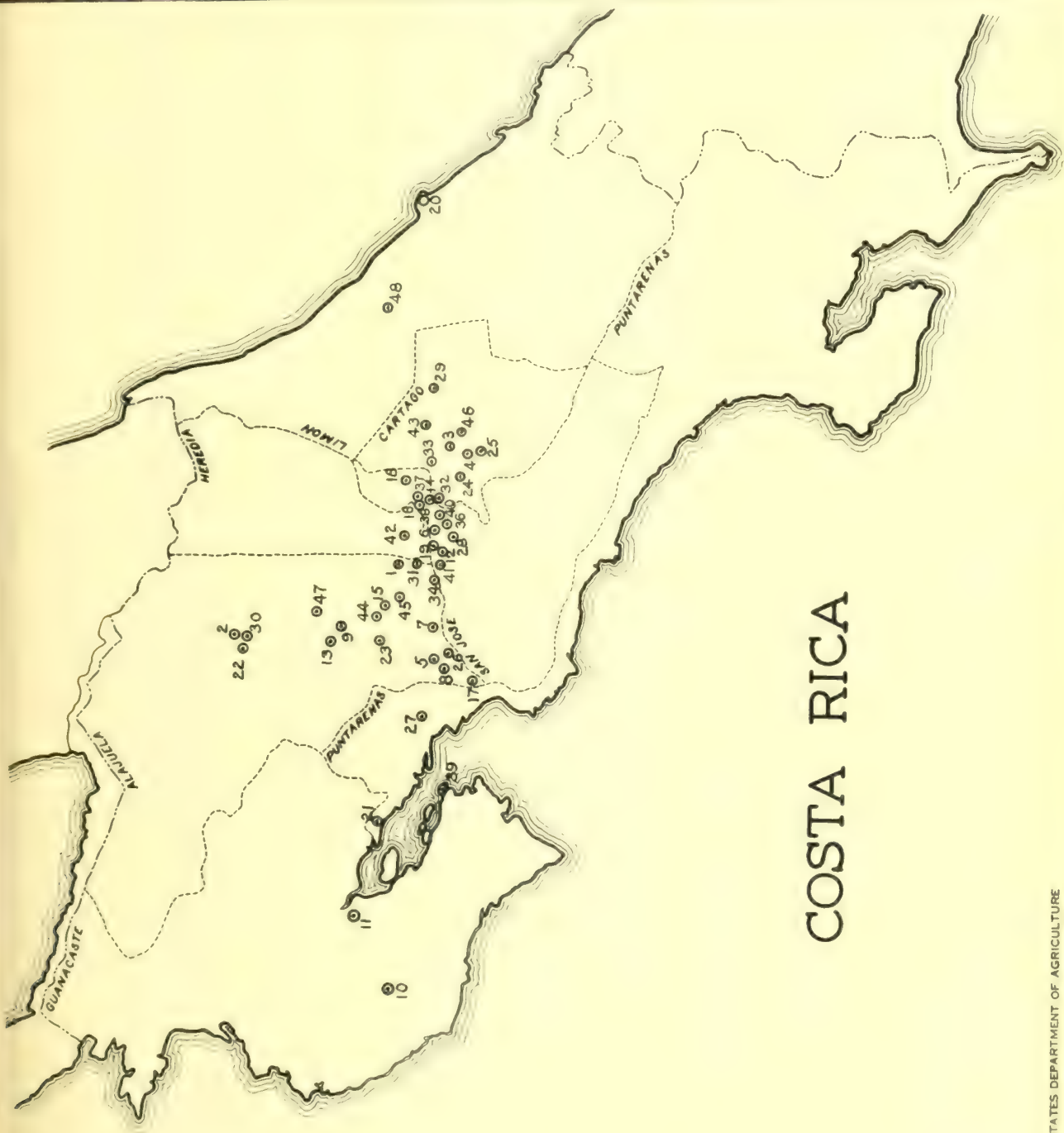
Santa Barbara = Santa Barbara de Meredia

The accompanying map was prepared for this publication by Rafael A. Chavarria, Director of the Centro Nacional de Agricultura.

### Explanation of Map

The letters in the following list give some idea of the climate when considered with the region in which the place lies. The eastern slope (E) is a humid region; the western slope (W) is dry; the central plateau (C) is moderate; San Carlos (S) is very wet. The number following the name represents altitude in feet. The number preceding the name is given to locate the place on the map.

- |    |  |    |  |
|----|--|----|--|
| 1  | Alajuela (C) 4490                                  | 25 | Orosi  |
| 2  | Boca de Konner (S) 600                             | 26 | Orotina (W) 853  |
| 3  | Canada de Cot (C) 7250                             | 27 | Pan de Azucar (W) 70   |
| 4  | Cartago (E) 5653                                   | 28 | Paso Ancho de San Sebastian (C)<br>Lower than San Jose       |
| 5  | Cascajal (W) 448                                   | 29 | Peralta (E) 1055 and Chitaria several<br>hundred feet higher |
| 6  | Charui (=San Jose)                                 | 30 | Quebrada Azul (S) About 800                                  |
| 7  | Concepcion (W) 1040                                | 31 | Rio Segundo (C) 3940   |
| 8  | Coyolar (W) 700                                    | 32 | Sabanilla (C)  |
| 9  | Cuesta del Macho (S) highest<br>part of San Carlos | 33 | Sanatorio Duran (C) 9090                                     |
| 10 | El Cacao (C)                                       | 34 | San Antonio de Belen (C) 3119                                |
| 11 | El Pizote (C) 6300                                 | 35 | San Dimas (C)  |
| 12 | Escasu (C) 4500                                    | 36 | San Francisco de Dos Rios (C)                                |
| 13 | Florencia (S)                                      | 37 | San Isidro de Coronado (C) 5580                              |
| 14 | Granadilla (C)                                     | 38 | San Jose (C) 4645  |
| 15 | Grecia (C) 4330                                    | 39 | San Lucas (W) 25   |
| 16 | Guadalupe (C)                                      | 40 | San Pedro de Montes de Oca (C) 5300                          |
| 17 | Lagunillas (W)                                     | 41 | Santa Ana (C) 3900   |
| 18 | La Holanda (C) 7480                                | 42 | Santa Barbara de Heredia (C) 5060                            |
| 19 | La Uruca (C) 4550                                  | 43 | Santiago de Paraiso (E) 3536                                 |
| 20 | Limon (E) 10                                       | 44 | Sarchi (C) 5400  |
| 21 | Manzanillo   | 45 | Tacares (C) 3200   |
| 22 | Muelle de San Carlos (S) 630                       | 46 | Ujarras  |
| 23 | Naranjo (C) 4673                                   | 47 | Villa Quesada (S)  |
| 24 | Ochomogo (On the Divide) 6059                      | 48 | Waldeck (E) 60   |



# COSTA RICA





## COLEOPTERA

ANTHICIDAE	C o l l e c t e d o n		Date Through- out year	Notes
	Chrysophyllum cainito	Trichilia havanensis		
Anthicus asphaltinus Champ. San Pedro	Persea americana			
CANTHARIDAE				
Diaphron proteum Gorn. Paso Ancho San Pedro	Acnistus arborescens Pastinaca sativa Persea americana	Spondias mombin	May 21 June 11	
CARABIDAE				
Calleida chryseis Bates Gadalupe San Pedro	Coffea arabica Persea drymifolia Vernonia brachiatata		Jan. 5 Sept. 30	Always taken be- tween leaves webbed together.
CERAMBYCIDAE				
Antodice cretata Bates San Pedro	Tournefortia foetid- issima		May 26	Eats midribs of leaves.
Estilogramma porosa Bates El Cacao	Eriolotya japonica		Nov. 12	
Orsodera costaricensis Thom. Escasu	Erythrina rubrinervia		Jan. 17	Called "Zapatero."
Phaea lateralis Bates Gadalupe San Pedro	Erythrina rubrinervia Ipomoea tiliacea		May 26	
CHRYSOMELIDAE				
Calligrapha elegantula Jacoby Ocotomogo San Pedro	Panicum barbinode Succcharum officinarum	Sida rhombifolia Zea mays	June 23 Aug. 28 Oct. 8	

C o l l e c t e d o n			Date	Notes
Cerotoma rogersi Jacoby Orosi Paso Ancho	Cestrum sp. Cucurbita pepo Calanzoga hispida Guarea caoba	Meibomia frutescens Phaseolus vulgaris Vicia faba Vigna sesquipedalis	Sept. 13 to Dec. 28	A serious pest of string beans.
Chalcophana mutabilis Harold Paso Ancho	Vernonia brachiata		May 31	
Cnelympha gressoria Boh. Ochoango	Asparagus officinalis		June 28	
Colaspis prasina Jacoby Adalupe San Pedro	Croton gossypifolius Cusa paradisiaca Pastinaca sativa Solanum lanceolatum var. sinuatum	Solanum melongena Solanum torvum Solanum tuberosum	Jan. 24 to June 22 Nov. 22 Dec. 20	Lives on wild Solanum and mi- grates to cul- tivated species, especially egg- plant.
Cryptocephalus trizonatus Suñir. Cojolar Paso Ancho San Isidro San Pedro	Amygdalus persica Cappisicum annuum Diospyros virginiana Diphysa robinoides Elephrium simaruba	Pisum sativum Prunus pissardi Sida rhombifolia Vernonia brachiata	Through- out year	
Cryptocephalus tessellatus Chevr. San Pedro	Malus sylvestris		Jan. 5	
Deloyala testudinaria Boh. El Cacao Orosi San Pedro	Acnistus arborescens Solanum nigrum		May 26 Sept. 13 Nov. 6	



C o l l e c t e d o n			Date	Notes
Diabrotica balteata Lec. Cojolar Guadalupe Muelle Ochomogo Pan de Azucar San Pedro Santa Ana Villa Quesada	Amaranthus spinosus Capsicum annuum Celosia cristata Citrus sp. (toronjo) Crescentia cujete Crotalaria striata Cucurbita ficifolia Heliotropium indicum Iberis sp. Lactuca sativa	Lycopersicum esculentum Malus sylvestris Pelargonium zonale Persea americana Phaseolus vulgaris Pisum sativum Sida rhombifolia Solanum tuberosum Zea mays	Feb. 19 to Dec. 20	When very abundant, causes consider- able damage, es- pecially on beans and potatoes.
Diabrotica corrusca Jacoby Ochomogo San Pedro	Chayota edulis Cucurbita pepo Phaseolus vulgaris	Solanum tuberosum	June 28 Sept. 8	
Diabrotica dorsoplagiata Jacoby San Pedro	Citrus sinensis		June 1	In flowers.
Diabrotica fulvicornis Jacoby San Dimas San Pedro	Citrus grandis Citrus limonia Citrus nobilis de- liciosa Citrus sinensis Erythrina rubrinervia	Eugenia jambos Persea americana Saccharum officinarum Vernonia brachiata Vicia faba	Mar. 16 to Dec. 20	
Diabrotica nummularis Harold Casta del Mecho Guadalupe Muelle Ochomogo Paso Ancho San Isidro Villa Quesada	Acacia melanoxylon Acanthus arborescens Ageratum conyzoides Amaranthus cruentus Amygdalus persica Anethum graveolens Annona cherimola Asclepias curassavica	Asparagus officinalis Eidens pilosa Bixa orellana Calocarpum nummosum Calyptanthus costari- censis Cestrum macrophyllum Chayota edulis	Through- out year	Very abundant and very destructive to potatoes throughout June at San Pedro. A general feeder, often destroying vegetable and flower gardens.

Diabrotica nummularis--Cont'd	C o l l e c t o r s		Date	Notes
Chrysanthemum maximianum	Chrysanthemum maximianum	Leucocarpus sp.		
Citrus limonia	Citrus limonia	Idios silvestris		
Citrus sinensis	Citrus sinensis	Parirsonia aculeata		
Colocasia sp.	Colocasia sp.	Persca americana		
Crotalaria stricta	Crotalaria stricta	Phaseolus vulgaris		
Cucurbita ficifolia	Cucurbita ficifolia	Phytolacca decandra		
Cucurbita pepo	Cucurbita pepo	Polygonum acre		
Dianthus caryophyllus	Dianthus caryophyllus	Prunus armeniaca		
Diospyros kaki	Diospyros kaki	Psidium guajava		
Erythrina rubrinervia	Erythrina rubrinervia	Papaver sativus		
Eschscholtzia californica	Eschscholtzia californica	Rosa spp.		
Eugenia uniflora	Eugenia uniflora	Rumex crispus		
Ficus carica	Ficus carica	Saccharum officinarum		
Hedychium coronarium	Hedychium coronarium	Solanum nigrum		
Hibiscus rosa-sinensis	Hibiscus rosa-sinensis	Solanum tuberosum		
Iberis sp.	Iberis sp.	Spondias mombin		
Impatiens balsamina	Impatiens balsamina	Terminalia catappa		
Ipomoea batatas	Ipomoea batatas	Vicia faba		
Ipomoea tiliacea	Ipomoea tiliacea	Vitis vinifera		
Lagerstroemia speciosa	Lagerstroemia speciosa	Zea mays		
Annona cherimola	Annona cherimola	Zinnia elegans		
Chayota edulis	Chayota edulis	Cucurbita pepo	Jan. 18	General feeder.
Citrus limonia	Citrus limonia	Iberis sp.	to	Destroyed candy-
Coffea arabica	Coffea arabica	Solanum tuberosum	Sept. 11	taft in July
Conostegia lanceolata	Conostegia lanceolata	Tripsacum laxum		at Guadelupe.
Cornutia cymosa	Cornutia cymosa	Vitis vinifera		
		Zea mays		
Cucurbita pepo	Cucurbita pepo	Saccharum officinarum	March 28	Abundant on corn
Eschscholtzia californica	Eschscholtzia californica	Sobralia decora	to	in August, es-
Iberis sp.	Iberis sp.	Tripsacum laxum	Dec. 20	pecially on
Inga patersonii	Inga patersonii	Verbena litoralis		the silk.
Pennisetum purpureum	Pennisetum purpureum	Zantedeschia aethiopica		

C o l l e c t e d o n			Date	Notes
Diabrotica vittata Fab.	Citrus sinensis		Feb. 15	Very abundant on
Ochomogo	Cucurbita ficifolia		June 28	various cucur-
Peralta	Cucurbita pepo		Aug. 22	bitaceous plants
San Dimas	Raphanus sativus		Dec. 20	
San Pedro				
Epitrix fuscata Jac.-Duv.	Capsicum annuum	Solanum tuberosum	Feb. 4	A serious pest of
Paso Ancho	Lycopersicon esculen-		to	potato and to-
	tum		Dec. 30	mato.
Galeruca encrustica Germ.	Casuarina equiseti-	Inga edulis	Apr. 20	
Granadilla	folia	Persea americana	to	
Paso Ancho	Citrus nobilis de-		Jun. 28	
San Pedro	liciosa		Oct. 25	
	Coffea arabica		to	
			Nov. 2	
Homophoea cynipennis octo-	Acinetia arborescens	Citricidia maculata	Feb. 5	Sometimes harmful
maculata Grotch	Allium cepa	Impatiens balsamina	to	on tender growth,
Coyolar	Amaryllis sp.	Isomeda batatas	Dec. 27	especially of
Cuesta del Macho	Amygdalus persica	Ligustrum japonicum		avocado.
El Cucuo	Anacardium rhinoceros	Nelus sylvestris		
Granadilla	Asparagus officinalis	Musa textilis		
Guadalupe	Canna indica	Pennisetum purpureum		
Orosi	Citrus grandis	Persea americana		
Paso Ancho	Citrus medica	Persea drymifolia		
San Pedro	Citrus sinensis	Phaseolus vulgaris		
Santa Ana	Coffea arabica	Saccharum officinarum		
Ville Quesada	Coix lachryma-jobi	Soja max		
	Croton gossypifolius	Tetragonia expansa		
	Pahlia rosea	Vitis vinifera		
	Dioscorea sp.	Zea mays		
	Gardenia japonica			



C o l l e c t e d o n			Date	Notes
Leptinotera undecimlineata Stahl	Phytolacca decandra			
Granadilla	Saccharum officinarum			Very common on
La Holanda	Solanum aculeatissimum			Solanum spp.
Muelle	Solanum torvum			
Ochomogo				
Orosi				
San Dimas				
San Pedro				
Metriona emarginata Boh.	Hamelia erecta		May 26	
San Pedro	Iponoea batatas		Oct. 5	
Nodonota irazuensis Jacoby	Acalypha wilkesiana		Jan. 5	Probably the most
El Cacao	Ageratum conyzoides		to	harmful insect
Grecia	Amaranthus cruentus		Dec. 31	observed during
Guadalupe	Amygdalus persica			the year. It
Ochomogo	Annona cherimola			feeds especially
Paso Ancho	Annona reticulata			on tender new
San Pedro	Asclepias curassavica			leaves.
Santa Ana	Bidens pilosa			
Villa Quesada	Bixa orellana			
	Boehmeria nivea			
	Calliandra grandiflora			
	Callistemon lanceolatus			
	Calyptanthus costaricensis			
	Camellia japonica			
	Carissa grandiflora			
	Cestrum aurantiacum			
	Cestrum lanatum			
	Chayota edulis			
	Chenopodium ambrosioides			
				nica
				Eugenia uniflora

Nodonota irezuensis---Cont'd	C o l l e c t o r	Date	Notes
Ficus carica	Prunus avium		
Fragaria chiloensis	Prunus pissardi		
Cliricidia maculata	Psidium guajava		
Ribiscus rosa-sinensis	Pyrus communis		
Impatiens balsamina	Rorhanus sativus		
Inga paterno	Posa spp.		
Ipomoea batatas	Ruellia crispus		
Ipomoea tiliacea	Saccharum officinarum		
Lippia berlandieri	Salvia sp. (China de		
Malacra radiata	Gutierrezia		
Malus sylvestris	Schinus molle		
Mangifera indica	Solanum tuberosum		
Morus rubra	Sterculia diversifolia		
Myrsotis sylvatica	Tagetes erecta		
Panicum bartinode	Terminalia catappa		
Pastinaca sativa	Touja plicata		
Pelargonium graveolens	Tripsacum laxum		
Pelargonium zonale	Tropaeolum majus		
Persea americana	Verbena		
Persea drymifolia	Vernonia brachiata		
Phaseolus vulgaris	Vicia faba		
Poinsettia pulcherrima	Vigna sesquipedalis		
Polygonum acre	Vitis vinifera		
Prunus armeniaca	Sea mays		
Ageratum conyzoides	Citrus sinensis	Throat-	Especially
Amygdalus persica	Coffea arabica	out	harmful to
Casuarina equisetifolia	Conostegia lanceolata	year.	roses.
Chenopodium ambrosioides	Couratella rosea		
Chrysanthemum maximum	Crotalaria striata		
Citrus limonia	Cupressus benthami		
	Piospyros virginiana		
	Dianthus caryophyllus		
Nodonota lateralis Jacoby			
Coyolar			
El Cacao			
Grecia			
Guadalupe			
San Isidro			
San Pedro			

C o l l e c t e d o n			Date	Notes
Nodonota lateralis--Cont'd.	Eugenia uniflora	Phaseolus vulgaris		
	Galinsoga hispidia	Prunus salicina		
	Hicoria pecan	Pyrus communis		
	Inga paterno	Rosa spp.		
	Malus sylvestris	Vernonia brachiata		
	Mangifera indica	Vitis vinifera		
	Myosotis sylvatica	Zinnia elegans		
	Panicum barbinode	Zea mays		
	Pelargonium graveo- lens			
	Amygdalus persica		June 18	Usually taken at lights.
	Eugenia uniflora	Saccharum officinarum	Feb. 5	
	Persea americana	Vicia faba	to Dec. 20	
	Prunus cerasifera		June 28	
	Zea mays			
	Cestrum sp.		June 18	
	Cucurbita pepo		to Dec. 9	
	Jatropha urens			
	Luffa cylindrica			
	Myosotis sylvatica			
	Phaseolus vulgaris			
	Phaseolus vulgaris		Dec. 7	
	Acnistus arborescens		March 2	A pest of Zorrillo (Cestrum spp.)
	Cestrum lanatum		to Dec. 22	throughout the year.
	Cestrum macrophyllum			
	Coffea arabica			
	Oediorhynchis tenuicincta			
	Jacoby			
	San Pedro			
	Pachybrachys femoratus Oliv.			
	El Cacao			
	San Pedro			
	Prionodera wagneri Harold			
	Ochomogo			
	COCCINELLIDAE			
	Epilachna borealis Fab.			
	Coyolar			
	El Cacao			
	San Dimas			
	San Lucas			
	San Pedro			
	Santa Ana			
	Epilachna corrupta Muls.			
	Grecia			
	Epilachna defecta Muls.			
	Guadalupe			
	Orosi			
	Paso Ancho			



Epilachna defecta--Cont'd.	C o l l e c t e d o r	Date	Notes
San Pedro Santa Ana	Croton gossypifolium Zea mays		
Epilachna vincta Crotch San Isidro	Vernonia brachiata	Jan. 26	
Epilachna virgata Muls. Paso Ancho San Pedro	Podakenium alatum	Fe. 4	Seriously damages
	Citharexalum caudatum	May 28	Dann.
ELATERIDAE Agriotes sublineatus Champ.	Citrus sinensis	Dec. 25	
San Pedro	Erythrina rubrinervia	May 26 to June 5	
EROTYLIDAE Cyphorotylus elevatus Fieb.	Coffea arabica	Apr. 5 Sept. 10	
San Pedro	Pleuratus sp.	May 29 Nov. 22	
MYCOTRETIDAE Mycotretus luteipes Lac.	Casuarina equiseti- folia	Apr. 20	
LYCIDAE Calopteron bifasciatum Gora.	Dovyalis hebecarpa	May 9	
San Pedro	Zantedeschia aethio- pica	Apr. 5	In flower.
MALVACHIDAE Anthocomus basilis Erichs.			
San Pedro			
NITIDULIDAE Colopteris morio Erichs.			
San Pedro			

S C A R A B A E I D A E			C o l l e c t e d o n		Date	Notes
Anomala testaceipennis Blanch. San Pedro	Rosa sp.				Oct. 22	
Euphoria candezei Janson Guadalupe	Couralea rosea				July 2	
Faula brunneipennis Bates Ocnomogo San Jose San Pedro	Anethum graveolens Asparagus officinalis Capsicum annuum Casuarina equiseti- folia Chayota edulis Coffea arabica Hicoria pecan	Malus sylvestris Pelargonium zonale Persea americana Persea drynifolia Pyrus communis Rosa sp. Vitis vinifera			May 14 to July 2	Destroyed a grape crop and damaged avocado at San Pedro early in June
Gymnetis liturata Oliv. Guadalupe San Pedro	Coffea arabica Ficus carica Persea americana Vernonia brachiata				Jan. 29 to Feb. 16 Nov. 20 to Dec. 17	Sucking sap at wound in bark of avocado. Eating fruit of fig.
Hoplia argyrites Bates San Pedro	Citrus sinensis Persea drynifolia Trinus pissardi				May 15 June 5	Eating flowers of avocado.
Hoplia surata Bates San Pedro	Malus sylvestris Spondias mombin				May 22, 26	
Macroductylus lineatus Chev. San Pedro	Persea americana				May 15 -30	Doing considerable damage.

C o l l e c t e d o n			Date	Notes
Macroductylus suavis Bates Paso Ancho San Pedro	Calcea urticifolia Citrus limonia Citrus sinensis	Cydonia oblonga Persea drymifolia Spondias mombin	May 28 to July 2	Damages avocado, especially flowers.
Macroductylus sylphis Bates Paso Ancho San Pedro	Acaistus arborescens Citrus aurantifolia Malus sylvestris Persea americana	Persea drymifolia	May 15 to June 18	Frequents flowers of Citrus spp. and destructive to avocado.
Pachystethus nicans Burm. San Pedro	Comostegia lanceolata		May 26	In flowers.
Pachystethus nitidula Blanch. San Pedro	Rosa sp.		Oct. 22	
Strigoderma rutelina Bates El Cacao	Phascolus vulgaris		Nov. 27	
STAPHYLINIDAE				
Paederus lactus Erichs. San Pedro	Fragaria chiloensis		Oct. 5	
Phyllanthus feralis Erichs. San Pedro	Pennisetum purpureum		Jan. 3	
TELEPHORICIDAE				
Lobometopon guatemalensis Champ.	Amygdalus persica Carya indica Carica papaya	Citrus sp. (toronjo) Coffea arabica Ligustrum japonicum		A tenebrionid ob- served feeding on pollen of
Grecia	Cestrum macrophyllum	Malus sylvestris		peach, plum, and
Guadalupe	Citrus limonia	Mangifera indica		avocado, probably
Muelle	Citrus nobilis de- liciosa	Persea americana		not a pest. Ob-
Ochomogo		Persea drymifolia		served eating peach-
San Dimas	Citrus sp. (tangelo)	Prunus pissardi		rust fungus.
San Pedro				



Lobometopon guatemalensis-- Cont'd	Collected on	Date	Notes
Schoenicus panamensis Champ. Grecia Guadalupe Paso Ancho San Pedro	Prunus salicina Terminalia catappa Thunbergia erecta	Vernonia brachiata Vicia faba Vigna sesquipedalis	
Acanthus arborescens Amygdalus persica Chenopodium ambrosioides Citrus aurantium Citrus sinensis Coffea arabica	Acanthus arborescens Amygdalus persica Chenopodium ambrosioides Citrus aurantium Citrus sinensis Coffea arabica	Hibiscus rosa-sinensis Malus sylvestris Pennisetum purpureum Persea americana Persea drymifolia Vigna sesquipedalis	A tenebrionid; frequents flowers. Probably not a pest. Eats pollen.
ANYCHOPHORA Anypotactus exilis Boh. San Pedro	Amygdalus persica Citrus nobilis delicatosa	Citrus sinensis	Jan. 6-27 Nov. 30
Cleistolophus similis Chev. San Pedro	Chenopodium ambrosioides Persea americana	Vernonia brachiata	May 24 June 5
Conotrachelus flavangulus Champ. San Pedro	Cucurbita pepo		Sept. 11
Conotrachelus perseae Barber San Pedro	Persea americana	Jan. 5 Aug. 13, 20 Nov. 20	Reared from larva in avocado seed. Usually found between leaves webbed together by caterpillars.
Copturus constrictus Champ. San Pedro	Persea americana	Dec. 19	Destroying avocado.

C o l l e c t e d o n			Date	Notes
Cosmopolites sordidus Germ. Waldeck	Musa sapientum		Feb. 13	Damaging bulbs. An important pest.
Eurhinus festivus Fab. San Pedro	Cestrum macrophyllum Vernonia brachiata		May 18 Nov. 19	
Geraeus lentiginosus Boh. El Cacao San Pedro	Carysanthemum maximum Eugenia jambos Phaseolus vulgaris Vicia faba		Apr. 20 Nov. 7 Dec. 20, 30	
Lecariops sp. San Pedro	Erythrina rubrinervia Vernonia brachiata		May 19 June 30	
Micentrus lineicollis Boh. San Pedro	Amaranthus spinosus Carysanthemum maximum Fragaria chiloensis	Poinsettia pulcherrima	Oct. 5 to Dec. 30	
Pandelecius erubescens Champ. Guadalupa San Pedro	Persea americana Persea drymifolia		Apr. 24 to Nov. 28	Eats avocado leaves.
Rhodobates bicinctus Chev. Ochomogo	Verbesina turbacensis		June 28	
Rhodobates pantherinus Champ. Ochomogo	Verbesina turbacensis		June 28	
Steirarninus nebulosus Champ. Paso Ancho San Pedro	Avicennia persica Blakkea gracilis Sodimaria nivea Cestrum lanatum Citharexylum caudatum Citrus limonia	Citrus notilis Citrus sinensis Coffea arabica Dovyalis hebecarpa Triurfetta josefina Vernonia brachiata	May 7- Aug. 7	

D I P T E R A

C o l l e c t e d   o n			Date	Notes
Anastrepha serpentina Wied. San Pedro	Carysophyllum sp.		Feb. 27 June 22 July 28	Larvae destroy fruit of star- apple. Adult reared July 28.
Anastrepha striata Schin. San Pedro	Mangifera indica Persea sp. Psidium guajava		Apr. 29 May 28 Aug. 20	Eggs in mango and guava fruit. Adult emerged May 28. Adults feed at avocado flowers.
Eusimulium callidum D. & S. San Pedro			June 2 Oct. 8, 10	
Eusimulium metallicum Bell. Orosi San Pedro			Through- out year.	A very trouble- some pest.
Eusimulium ochraceum Walk. San Pedro			Feb. 26	
Eusimulium quadrivittatum Loew San Pedro			June 4 to July 19. Dec. 15	
Raynchosciara brevicornis Guer. San Pedro	Amygdalus persica Fortunella japonica Malus sylvestris Persea americana Solanum muricatum		June 18 Dec. 10- 28	Probably not a pest.



C o l l e c t e d o n		Date	
Tetrauresta obscuriventris Loew San Pedro	Erythrina rubrinervia Vernonia brachiata	May 18	Abundant on the leaves.
Toxotrypana curvicauda Gerst. Grecia	Carica papaya	Oct. 16	Destroys all papaya fruit in some regions, especially in San Pedro.

# H E M I P T E R A

Acanthocephala declivis var. guatemalensis Dist. San Pedro	Calyptanthus costaricensis Casimiroa edulis Citrus aurantium Citrus grandis Citrus limonia	Citrus nobilis deliciosa Citrus sinensis Citrus sp. (tangelo) Citrus sp. (toronjo) Poncirus trifoliata	Jan. 6 to Dec. 28	Very numerous on citrus fruits, causing the tips of branches to wilt.
Acrosternum marginatum P. de B. Villa Quesada	Citrus sinensis		March 27	
Alsea andresii Guer. Peralta San Pedro	Cucurbita pepo		Feb. 15 Sept. 11 Oct. 1	
Alsea scorbutica Fab. San Dimas San Pedro	Cucurbita pepo		Aug. 31 Oct. 10	
Anisoscelis gradadua Dist. San Pedro	Passiflora quadrangularis		Nov. 20	
Archimerus scutellaris Stahl Faso Ancho San Pedro	Calea urticifolia exillaris Coix lachrymans-jobi		May 26, 31 Sept. 13	Causes tips to wilt.

C o l l e c t e d o n			Date	Notes
Campocerus odiosus Stahl Coyolar San Lucas	Cynopogon rufus Zea mays		July 7 Sept. 16	
Chlorocoris aberrans Dist. San Pedro	Persea americana		March 17	
Collaria oleosa Dist. El Cacao Lagunillas San Pedro Santa Ana Villa Quesada	Panicum barbinode Paspalum notatum Phaseolus vulgaris Sanchezia nobilis Zea mays		Feb. 14 March 28 Sept. 18 to Dec. 21	A mirid, abundant and harmful on grasses, caus- ing leaves to dry.
Corecoris sp. San Pedro	Cayota edulis Coffea arabica	Ipomoea tiliacea Tournefortia foetidis- sima	June 14 July 3 Sept. 25	
Corizus sidne Fab. San Pedro	Malacra radiata		June 18	
Corythucha gossypii Fab. Alajuela San Jose San Pedro	Angedalus persica Annona muricata		Apr. 1	Seriously damages sourson.
Cosmopepla decorata Hahn San Pedro	Apium ammi		May 26	A pentatomid.
Creontiades rubrinervis Stahl San Pedro	Coffea arabica Hibiscus rosa-sinensis Malus sylvestris	Persea americana Vicia faba	Jan. 25- July 12	A mirid.
Cyrtopeltis notatus Dist. Paso Ancho San Pedro	Lycopersicum esculen- tum Nicotiana tabacum		Feb. 4 to June 18. Nov. 13-	A mirid pest of tomato and to- bacco.

C o l l e c t e d o n			Date	Notes
Dinocoris tripterus Fab. Peralta	Mangifera indica		Aug. 4	A pentatomid.
Dysdercus mimas Say Paso Ancho San Pedro	Annona cherimola Croton gossypifolium		May 31 June 15	A pyrrhocorid.
Dysdercus obliquus H. S. Grandilla San Pedro	Althea rosea Caena indica Citrus sinensis	Coffea arabica Hibiscus rosa-sinensis	Sept. 11 to Dec. 10	Serious pest of hollyhock and other malva- ceous ornamentals.
Edessa cornuta Burm. San Pedro	Ipomoea batatas Ipomoea tiliacea		Aug. 31 Oct. 5	A pentatomid.
Edessa junix Stahl El Cacao	Coffea arabica		Nov. 6	
Edessa galvini Dist. San Pedro	Croton gossypifolium		May 26	
Euschistus bifibulus P. de F. San Lucas	Acacia mays		July 8	A pentatomid.
Gargaphia patricia Stahl Paso Ancho San Dimas San Isidro San Pedro	Acrisus arborescens Croton gossypifolium		Jan. 26 May 31 Aug. 31	A tingidid.
Halticus citri Ashm. El Cacao Paso Ancho San Pedro Santa Barbara	Capriola dactylon Cucurbita pepo Gomphrena globosa Jacobinia coccinea Lactuca sp.	Phaeocolus vulgaris Rachamus sp. Solanum tuberosum Tetragonia expansa Zantedeschia aethio- pica	Feb. 1 to Apr. 5 Nov. 7- Dec. 27	A mirid, one of the most serious pests of the vegetable garden.



C o l l e c t e d o n			Date	Notes
Hypselonotus atratus Dist. El Cacao Guadalupe Crosi Paso Ancho San Pedro Villa Quesada	Ananas sativus Coffea arabica Conostegia macrantha Cucurbita pepo Dovyalis hebecarpa Lactuca sativa Polygonum punctatum	Psidium friedrichsta- lium Saccharum officinarum Vernonia brachiata	Jan. 16 to May 31 Sept. 13 Dec. 25	A coreid.
Jadera esola Dallas San Pedro	Persea americana		March 23	A coreid.
Jalysus mollitus Dist. El Cacao Paso Ancho	Pelargonium zonale Phaseolus vulgaris		Nov. 6, 7 Dec. 25	A neidid.
Leptobrysa chiriquensis Champ. San Pedro	Persea americana		Nov. 20, 26	A tingidid.
Leptoglossus stigma Hbst. San Pedro	Bixa orellana Carica papaya Morus rubra		Feb. 6 to Apr. 5 Nov. 30 Dec. 19	A coreid.
Leptoglossus zonatus Dallas El Cacao Grecia Ochomogo San Dimas San Pedro Santa Ana	Anyedalus persica Bixa orellana Capsicum annuum Carica papaya Citrus nobilis do- liciosa Citrus sinensis Cucurbita pepo	Cyphomandra betacea Ficus carica Lycopersicum esculen- tum Persea americana Phaseolus vulgaris Prunus armeniaca Vitis vinifera	Through- out year	Damages fruit of tomato severely.

C o l l e c t e d o n			Date	Notes
Lygaeus bistrigatus Say San Pedro	Coffea arabica Cucurbita pepo		Aug. 17 May 17	A lygaeid.
Lygaeus circumlitus Stahl San Pedro	Annona cherimola Ligustrum japonicum Persica americana		May 18 Dec. 13	
Lygaeus reclusianus Say Santa Ana	Ipomoea tiliacea Gramineae		Nov. 22	
Megalotomus femoratus Dist. El Cacao	Phaseolus vulgaris		Nov. 7	A coreid.
Homalicta notulata H. & S. El Cacao	Phaseolus vulgaris		Nov. 7	A pentatomid.
Nezara viridula L. Ochenogo San Pedro	Alygdalus persica Brassica oleracea botrytis Brassica oleracea capitata Cucurbita pepo Impatiens balsamina	Lygaeus esculentus tata Ficus communis Pisonia sativus Solanum tuberosum Vicia sesquipedalis	June 18 to Dec. 20	A pentatomid.
Circulipes cingulifer Stahl Cuesta del Macho Machila Crosi F. de Ancho El Segundo San Pedro Santa Ana Villa Quesada	Accelcias curassavica Citrus sinensis Vernonia brachiata		Mar. 25 to Nov. 22	A lygaeid, common on millweed.

C o l l e c t e d   o n			Date	Notes
Encopeltus fasciatus Dallas Orosi San Pedro Santa Ana	Asclepias curassavica		Sept. 13	A milkweed pest.
	Coffea arabica		Oct. 8 Nov. 22	
Pachycoris torridus Scop. Orosi Paso Ancho San Pedro	Acnistus arborescens	Vitis vinifera	Sept. 13 to Nov. 19	A scutellerid.
	Asparagus plumosus Malus sylvestris Saccharum officinarum			
Paracalocoris annulatus Dist. San Pedro	Chalcas exotica	Persea americana	Feb. 5	A mirid.
	Coffea arabica Malus sylvestris	Persea drymifolia Vicia faba	July 2- Aug. 20 Dec. 20	
Ethnia lunata Fab. San Pedro	Cucurbita pepo		Dec. 30	A coreid.
Foecilopapsus frumentarius Dist. Guadalupe San Pedro	Vernonia brachiata		Sept. 7 Dec. 17	A mirid, sometimes predacious.
Polymerus cuneatus Dist. San Pedro	Crotalaria juncea		Nov. 19	A mirid.
Proxys punctulatus Beauv. Coyolar San Lucas Santa Ana	Amygdalus persica	Solanum scaphothianum	July 7	A pentatomid.
	Bromelia pinguin Persea americana Spondias mombin	Zea mays	to Nov. 22	
Pycnoderes incurvus Dist. Peralta San Pedro	Cucurbita ficifolia		Feb. 15	A mirid.
	Cucurbita pepo Ipomoea tiliacea		Aug. 31 to Dec. 20	



C o l l e c t e d o n			Date	Notes
Stenomacra marginella H. & S.	Anygdalus persica	Ipomoea tiliacea	Through-	A pyrrhocorid,
Granadilla	Annona cherimola	Lagerstroemia speciosa	out	serious pest
Guadalupe	Cestrum lanatum	Mangifera indica	year.	of avocado
Ochomogo	Citrus aurantium	Morus rubra		and coffee.
San Dimas	Citrus sirensis	Persea americana		
San Pedro	Coffea arabica	Vernonia brachiata		
	Ficus religiosa			
Thyanta perditor Fab.	Asparagus officinalis	Malacra rediata	Jan. 30-	A pentatomid.
Coyolar	Citrus aurantifolia	Persea americana	June 18	
San Pedro	Cupressus benthami	Solanum tuberosum	Sept. 17	
	Ficus religiosa	Tetragonia expansa	Dec. 17	
	Lycopersicum esculen-			
	tum			

## H O M O P T E R A

### ALEYRACIDAE

Aleurocanthus woglumi Ashby	Citrus aurantifolia	Poncirus trifoliata	Through-	A parasit., Eret-
Alajucla	Citrus limonia		out	moccus serius
Coyolar	Citrus medica		year	Silv., is estab-
Grecia	Citrus nobilis			lished at La
Guadalupe	Citrus sinensis			Cruc. It was
La Uruca	Coffea arabica			liberated at
Paso Ancho	Eugenia jambos			Mercedia in
Rio Segundo	Eugenia uniflora			August.
San Antonio	Persea americana			
San Pedro	Persea drymifolia			
Aleurothrixus howardi Quaint.	Citrus limonia		Feb. 4	
Paso Ancho	Citrus sinensis		to	
San Jose	Hamelia erecta		Sept. 3	
San Pedro	Persea americana			

APHIDIIDAE

Aphidius		Collected on		Date	Notes
Aphis gossypii Glov. San Pedro		Hibiscus rosa-sinensis Persea sp.		Aug. 8 Dec. 26	
Aphis illinoisensis Shim. San Pedro		Vitis labrusca Vitis vinifera		Apr. 19- June 18	Caused considerable damage in April and May.
Aphis pomi Deg. Guadalupe San Jose San Pedro		Cydonia oblonga Eriobotrya japonica Malus sylvestris Pyrus communis		Through- out year	Especially harmful on first leaves of newly budded stock.
Aphis spiraeicola Patch San Pedro		Citrus nobilis delici- osa Fortunella japonica		Jan. 5- Aug. 13	
Eriosoma lanigera Hausm. Guadalupe		Malus sylvestris		July 14	
Rhopalosiphum pseudobrassicae Davis San Pedro		Brassica japonica		Dec. 28	An important pest.
Toxoptera aurantiae Boyer Granadilla Guadalupe Ochomogo Paso Archo Peralta San Isidro San Pedro		Chalcas exotica Citrus limoria Citrus nobilis de- liciosa Citrus sinensis Coffea arabica Ficus religiosa Fortunella japonica	Mammea americana	Through- out year	Causes damage, es- pecially on ten- der shoots.
CERCOPIDAE Cephus siccifolius Walk. San Pedro		Amygdalus persica Persea drymifolia		Jan. 6, 25	Forms masses of foam- like spittle that

*Cephus siccifolius*--Cont'd

*Clastoptera funesta* Stahl  
Crescequi  
San Pedro  
Villa Quesada

*Epieremion championi* Fowl.  
San Pedro

*Monocophora bicincta* Say  
Coyolar  
El Cacao  
Ochomogo  
Paso Ancho  
San Pedro  
Santa Ana  
Villa Quesada

*Monocophora postica* Walk.  
Alajuela  
Foca de Kopper  
Florescia  
Orosi  
Villa Quesada

CHLORIDAE

*Frayseria ornstii* Schwarz  
San Pedro

Collected on

Date

Notes

Dec. 13,  
27  
hang over one  
foot from the  
branches, and  
which are blown  
around by the wind.

*Gardenia florida*  
*Guzmania ulmifolia*  
*Polydora punctatum*  
*Verbesina turbacensis*

March 7,  
27  
May 24

*Anacardium occidentale*  
*Calyptanthus costaricensis*  
*Cestrum aurantiacum*  
*Mangifera indica*  
*Malus sylvestris*

May 21  
Oct. 5 to  
Dec. 14

*Anethum graveolens*  
*Capriola dactylon*  
*Musa paradisiaca*  
*Paspalum notatum*  
*Zea mays*

March 26  
June 26--  
Nov. 22

*Colea urticifolia*  
*Panicum barbinode*  
*Paspalum notatum*  
*Zea mays*

March 26-  
30  
June 26  
Aug. 10-  
Sept. 13

*Cedrela montana mexicana*  
*Guarea caoba*

Jan. to  
May  
Oct. 10

Very abundant and  
injurious.



CICADELLIDAE			C o l l e c t e d o n		Date	Notes
<i>Aallia novella tropicalis</i>			Amaranthus sop. Lantana camara Phaseolus vulgaris		Oct. 25- Dec. 24	
Van D. El Cacao Granadilla San Pedro						
<i>Aliqia modesta</i> O. & B.			Chayota edulis Gramineae Hibiscus rosa-sinensis Phaseolus vulgaris		Aug. 31 Nov. 7- Dec. 7	
El Cacao Grecia San Pedro Santa Ana						
<i>Aulacizes panamensis</i> Fowl.			Citrus limonia Eugenia jambos		Jan. 6 June 27 Aug. 29 Sept. 13	
San Pedro						
<i>Aulacizes thunbergi</i> Stanl			Acnistus arborescens Jatropha urens			
Orosi Ujarras						
<i>Carneccephala sagittifera</i>			Amygdalus persica Capriola dactylon Hibiscus rosa-sinensis Phaseolus vulgaris		Jan. 29 to March 6 Sept. 18 to Dec. 7	Very abundant on Bermuda grass.
Uhl. Coyolar El Cacao Grecia San Antonio San Pedro Santa Ana						
<i>Chinaia bella</i> Bruner & Met-			Persea americana		March Aug.- Nov.	
calf San Pedro						
<i>Cicadella areolata</i> Sign.			Amaranthus cruentus Annona cherimola Boehmeria nivea Calyptranthes costaricensis		Jan. 12	Cucurbita pepo Fragaria chiloensis Gramineae Hamelia erecta Pelargonium zonale
Coyolar El Cacao San Pedro						

## Cicadella areolata--Cont'd.

C o l l e c t e d o n			Date	Notes
Cicadella coeruleovittata Sign.	Persea drymifolia Phaseolus vulgaris Saccharum officinarum Spondias mombin Tetragonia expansa	Tripsacum laxum Verbena litoralis Vitis vinifera Zea mays		
El Cacao	Brassica spp. Daucus carota Galinsoga hispida Ipomoea spp.	Persea americana Phaseolus vulgaris Rumex crispus Tetragonia expansa	Through- out year.	
Orosi	Lycopersicum esculen- tum Paniceum barbinode Pennisetum purpureum	Verbesina turbacensis Vernonia brachiata		
San Dimas	Solanum torvum		Feb. 14	
San Pedro	Crotalaria gossypifolium Vernonia brachiata		Through- out year	
Villa Quesada	Calceolaria juncea Hibiscus rosa-sinensis Rumex crispus Sanchosia nobilis Spondias cytherea	Tropaeolum majus Zea mays	Jan. 26- March 26 June 7- Dec. 21	
Cicadella miniaticeps Fowl.	Calceolaria juncea Hibiscus rosa-sinensis Rumex crispus Sanchosia nobilis Spondias cytherea			
Orosi	Paspalum notatum		Jan. 10- Aug. 22 Nov. 22	
Peralta				
Cicadella lutea Sign.				
San Pedro				
Cicadella miniaticeps Fowl.				
Orosi				
Peralta				
San Isidro				
San Pedro				
Villa Quesada				
Cicadella mollicella Fowl.				
Alajuela				
San Pedro				
Santa Ana				

C o l l e c t o n			Date	Notes
Cicadella occatoria Say	Acnistus arborescens	Lantana camara	Through-	
Coyolar	Amygdalus persica	Malacra radiata	out	
Cuesta del Macho	Arracacia xanthorrhiza	Malus sylvestris	year	
El Cacao	Boehmeria nivea	Oryza sativa		
Grecia	Brassica spp.	Panicum barbinode		
Paso Ancho	Camellia japonica	Pelargonium zonale		
Peralta	Carissa grandiflora	Persea americana		
San Lucas	Citrus limonia	Phaseolus vulgaris		
San Pedro	Coffea arabica	Psidium guajava		
Santa Ana	Coleus blumei	Rosa sp.		
Villa Quesada	Dahlia rosea	Sanchezia nobilis		
Waldeck	Dianthus barbatus	Sida rhombifolia		
	Elaeagnus sinaruba	Solanum seafortianum		
	Ficus carica	Spondias mombin		
	Guazuma ulmifolia	Tetragonia expansa		
	Hamelia erecta	Verbesina turbacensis		
	Hibiscus esculentus	Vernonia brachiata		
	Impatiens balsamina	Zea mays		
	Ipomoea batatas			
Cicadella pardalina Fowl.	Amygdalus persica	Eugenia uniflora	Through-	
Granadilla	Anacardium occidentale	Ligustrum japonicum	out	
Guadalupe	Casuarina equisetifolia	Malus sylvestris	year	
Sabanilla	Citrus grandis	Morus rubra		
San Dimas	Citrus limonia	Parkinsonia aculeata		
San Pedro	Citrus nobilis deliciosa	Prunus armeniaca		
	Citrus sinensis	Racemula edulis		
	Coffea arabica	Spondias mombin		
Cicadella pulchella Guer.	Brassica oleracea capitata	Gramineae	May 28	
Coyolar	Crotalaria retusa	Hibiscus rosa-sinensis	July 2	
El Cacao	Fuchsia sp.	Jatropha urens	Sept. 13-	
Grecia		Lantana camara	18	





C o l l e c t e d o n			Date	Notes
Cicadella testudinaria Fowl. Coyolar Granadilla Guadalupe Paso Ancho San Antonio San Pedro	Annona cherimola Coffea arabica Bauvardia humboldti Elaphrium simaruba Gramineae Lagerstroemia indica Merium oleander	Persea americana Sida rhombifolia Spondias cytherea	Jan. 8-29 Feb. 16 Aug. 9 to Sept. 19	
Cicadella variegata Fab. El Cacao	Phaseolus vulgaris		Nov. 6-7	
Cicadula maidis DeLong and Wolcott San Pedro	Crotalaria juncea Zea mays		July 13- Dec. 10	Abundant and harmful on young corn.
Deltocephalus flavicosta Stahl El Cacao San Pedro	Phaseolus vulgaris Tetragonia expansa		Nov. 7 Dec. 26	
Diestostemma albipenne Fab. Granadilla Guadalupe San Pedro	Amygdalus persica Citrus medica Coffea arabica Pyrus coranais	Thaetsia fructicosa	Jan. 5- May 18 Sept. 10- Oct. 25	Causes severe tip-wilt of coffee.
Diestostemma ruficoll. Sign. Granadilla Paso Ancho San Pedro	Asparagus plumosus Bixa orellana Citrus limonia Citrus sinensis	Coffea arabica Thaetsia fructicosa	Through-out year	
Euseclis obscurinervis Stahl San Isidro	Gramineae		Jan. 26	
Graphocephala anceps Fowl. Coyolar San Pedro	Persea americana Spondias mombin		Sept. 17	

C o l l e c t e d o n			Date	Notes
Graphocephala coccinea Forst. San Lucas San Pedro Ujaras	Amygdalus persica Annona cherimola Calyptanthus costaricensis Citrus nobilis deliciosa Citrus sinensis Codiaeum variegatum Coffea arabica Ficus religiosa Hibiscus rosa-sinensis Jatropia urens Lippia berlandieri	Malus sylvestris Mangifera indica Persea americana Prunus armeniaca Prunus salicina Pyrus communis Rosa sp. Sambucus mexicanus Schinus molle Tetragonia expansa Vernonia brachiata Vicia faba	Through-out year	
Graphocephala urbana Stahl San Pedro	Impatiens balsamina Spondias mombin	Verbesina turbacensis Vernonia brachiata	Aug. 31 to Sept. 5 Dec. 20	
Graphocephala versuta Say Granadilla Paso Ancho San Dimas San Pedro	Canarium odoratum Citrus limonia Citrus sinensis Codiaeum variegatum Coffea arabica Eugenia uniflora	Ficus religiosa Mangifera indica Musa paradisiaca Pouteria caimito Spondias mombin	Through-out year	
Gynonea scarlatina vinula Stahl Ochoingo San Pedro	Hamelia erecta Hymenaea courbaril Ipomoea sp.	Persea americana Solanum aculeatissimum	May 22-26 June 28 Oct. 5	
Gynonea vulnerata Walk. Granadilla Paso Ancho San Dimas San Pedro	Amygdalus persica Annona cherimola Annona reticulata Calyptanthus costaricensis Cestrum macrophyllum	Chrysanthemum sp. Citrus aurantium Citrus limonia Citrus sinensis Coffea arabica	Through-out year	



Gypona vulnerata--Cont'd	C o l l e c t e d o n		Date	Notes
Kolla fasciata Walk. Alajuela Coyolar El Cacao Quebrada Azul San Antonio San Pedro Santa Ana Villa Quesada	Eugenia uniflora	Persea drymifolia	Through- out year	
	Hibiscus rosa-sinensis	Pouteria caimito		
	Hicoria pegan	Rumex crispus		
	Inga patero	Salvia splendens		
	Mangifera indica	Schinus molle		
	Panicum barbinode	Spondias mombin		
	Persea americana	Vitis spp.		
	Capriola dactylon			
	Paspalum notatum			
	Phaseolus vulgaris			
Kolla geometrica Sign. El Cacao San Pedro	Sida rhombifolia		Oct. 10 Nov. 7 Dec. 31	
	Tetragonia expansa			
	Citrus sinensis			
	Lactuca sativa			
	Phaseolus vulgaris			
	Amgdalus persica	Guazuma ulmifolia		
	Anacardium occidentale	Jatropha urens		
	Anethum graveolens	Lagerstroemia indica		
	Calliandra grandiflora	Lantana camara		
	Citrus grandis	Malus sylvestris		
Oncometopia undata Fab. Coyolar Grecia Guadalupe Lagunillas Ochomogo Orosi Rio Segundo San Pedro Ujaras	Citrus nobilis de- liciosa	Phaseolus vulgaris	Jan. 5 to Oct. 16	Most abundant in lower altitudes.
	Citrus sinensis	Prunus avium		
	Coffea arabica	Tamarindus indica		
	Erythrina rubrinervia	Vernonia brachiata		
	Eriobotrya japonica	Vitis vinifera		
	Guarea caoba			

## COCCIDAE

C o l l e c t e d o n			Date	Notes
Aspidiotus camelliae Sign. San Pedro	Mangifera indica Pyrus communis		Feb. 23 July 3	
Asterolecanium pustulans Cxl. Coyolar El Cacao	Merium oleander		Sent. 17 Nov. 7	
Aulacaspis pentagona Targ. Paso Ancho San Pedro	Amygdalus persica Capsicum annuum Diospyros kaki Diospyros virginiana Hibiscus mutabilis Hicoria pecan	Mangifera indica Morus rubra Prunus armeniaca Prunus pissardi Prunus salicina Solanum muricatum	Through- out year	Very abundant and injurious.
Ceroplastes cirripediformis Comst. Paso Ancho San Pedro	Diospyros kaki Diospyros virginiana Coniobus edulis Persea drymifolia		Jan. 23 to Feb. 2 Aug. Oct.	
Ceroplastes floridensis Comst. Granadilla Peralta Quebrada Azul San Pedro Santa Ana	Amygdalus persica Calyptranthes costaricensis Citrus aurantifolia Citrus sinensis Citrus sp. (toronjo) Coffea arabica Diospyros kaki Diospyros virginiana Eriobotrya japonica	Malus sylvestris Mangifera indica Folargonium sp. Persea americana Poncirus trifoliata Pouteria caimito Schinus molle Solanum seaforthianum Zea mays	Through- out year	
Chrysomphalus dictyospermi Morg. San Pedro	Citrus aurantium Citrus grandis Citrus sinensis	Rosa sp.	April June 30	Very harmful on roses and young orange trees.

C o l l e c t e d o n			Date	Notes
Coccus acuminatus Sign.	Eriobotrya japonica		Feb. 14	
Cascajal	Jasminum grandiflorum		March 7	
Paso Ancho	Jasminum sambac		May 31	
Peralta	Mangifera indica		Oct. 7	
Coccus hesperidum L.	Citrus aurantifolia	Psidium guajava	Jan. 21-	
Guadalupe	Citrus sinensis	Solanum seafortianum	Feb. 4	
Paso Ancho	Diospyros kaki		Oct. 2-	
San Pedro	Eugenia uniflora		Dec. 28	
Tacares	Fortunella japonica			
Coccus viridis Green	Citrus sinensis		Sept. 18	
Lagunillas				
Eriococcus araucariae Mask.	Araucaria brasiliana		June 22	
San Pedro				
Fiorinia fioriniae Targ.	Camellia japonica		Through-	
San Pedro			out	
			year	
Icerya montserratensis Riley	Citrus sinensis		May 18	
& Howard	Mangifera indica		Sept. 17	
Coyolar				
San Pedro				
Ischnaspis longirostris Sign.	Coffea arabica		Apr. 3	
San Pedro				
Lepidosaphes beckii Newm.	Chalcas exotica		Through-	One of the most
Guadalupe	Citrus aurantifolia		out	harmful pests
Ochomogo	Citrus nobilis de-		year	on orange
Paso Ancho	liciosa			jessamine and
San Isidro	Citrus sinensis			on Citrus spp.
San Lucas	Citrus sp. (toronjo)			
San Pedro				



C o l l e c t e d   o n			Date	Notes
Orthezia insignis Dougl. Naranjo Faso Ancho San Jose San Pedro	Coleus blumei Salvia splendens		Feb. 14 July 5 Aug. 14 Nov. 13	
Pseudischnaspis bowreyi Ckll. Ochomogo San Pedro	Annona cherimola Diospyros kaki Diospyros virginiana		Jan. 1- Dec. 27	Kills rose bushes.
Pseudococcus citri Risso Granadilla San Pedro	Casimiroa edulis Citrus aurantium Citrus limonia Citrus nobilis de- liciosa		Feb. 17 June 5-20 Aug. 7-27 Dec. 21- 28	Especially harmful on young trees and among coffee flowers and fruit.
Pseudococcus nipae Mask. San Jose San Pedro	Chamaedora bifurcata Persea americana Psidium guajava		April 25 June 4-30	
Pseudococcus virgatus Ckll. Coyolar	Codiaeum variegatum Persea gratissima		Sept. 16	
Fulvinaria psidii Mask. San Pedro	Canarium odoratum Diospyros kaki Lucuma mammosa	Pouteria caimito Psidium guajava	Through- out year	
Saissetia hemisphaerica Targ. Alajuela Coyolar El Cacao Guadalupe Paso Ancho Feralta San Antonio	Annona muricata Asparagus officinalis Casimiroa edulis Cedrela montana mexi- cana Citrus aurantifolia Citrus aurantium Citrus grandis	Citrus limonia Citrus medica Citrus nobilis de- liciosa Citrus sinensis Cycas revoluta Cyphomandra betacea Coffea arabica	Through- out year	Abundant and very harmful on tender new growth.

Saissetia hemisphaerica-- Cont'd.	C o l l e c t e d o n	Poinsettia pulcher- rima	Date	Notes
San Dimas San Isidro San Pedro Santa Barbara	Diospyros kaki Diospyros virginiana Eugenia uniflora Gardenia florida Hamelia erecta Jacobinia coccinea Mammea americana Mangifera indica Morus rubra Nephrolepis sp. Pereskia aculeata Persea gratissima	Poinsettia pulcher- rima Poncirus trifoliata Boutonia calmito Psidium guajava Psidium molle Rheedia edulis Schinus molle Solanum muricatum Solanum seaforthianum Thunbergia erecta	Jan. 12 Apr. 4-19 Nov. 13	Merium oleander Vitis vinifera
Saissetia nigra Nietn. San Pedro	Annona cherimola Capsicum annuum Diospyros kaki	Merium oleander Vitis vinifera	Jan. 10- 26 Feb. 26 June 5 Aug. 15- 20	A heavy infestation on roots of sugar- cane caused severe damage at El Cacao in November.
Saissetia oleae Bern. Paso Ancho San Pedro	Elighia sapida Cassia spectabilis Diospyros kaki Fortunella japonica Hicoria pocan Pyrus communis	Merium oleander Vitis vinifera	Dec. 25 Feb. 4 May 31 Dec. 25	A heavy infestation on roots of sugar- cane caused severe damage at El Cacao in November.
Solenaspis articulatus Morg. Paso Ancho	Jasminum sambac	Merium oleander Vitis vinifera	July 8 Nov. 6-12	A heavy infestation on roots of sugar- cane caused severe damage at El Cacao in November.
Trionymus sacchari Ckll. El Cacao San Lucas	Saccharum officinarum	Merium oleander Vitis vinifera	Aug. 17 Nov. 30	A heavy infestation on roots of sugar- cane caused severe damage at El Cacao in November.
FULGORIDAE Asenalonbia virescens Stål Paso Ancho San Pedro	Cymbopogon rufus Erythrina rubrinervia	Persea americana Spondias mombin	Aug. 17 Nov. 30	A heavy infestation on roots of sugar- cane caused severe damage at El Cacao in November.

	C o l l e c t e d o n	Date	Notes
Bothriocera tinealis Burm. Muelle Ocnomogo Orosi San Pedro Villa Quesada	Acnistus arborescens Calea urticifolia Calliandra grandiflora Hedychium coronarium Pennisetum purpureum Spondias mombin	March 28, 29 May 18-28 Sept. 13 Nov. 13- 19	
Colgorma proxima Fowl. San Pedro	Ficus carica	Aug. 31	
Colpoptera sinuata Burm. Granadilla Paso Ancho San Pedro	Cestrum lanatum Cestrum macrophyllum Coffea arabica Dovyalis hebecarpa Ficus religiosa Galinsoga hebecarpa	Through- out year	Gardenia florida Gomphrena globosa Hibiscus rosa-sinensis Lippia berlandieri Spondias mombin Vernonia brachiata
Copicerus irroratus Swartz Santa Ana	Gramineae	Nov. 22	
Cyrpoptus belfragi Stahl El Cacao	Phaseolus vulgaris	Nov. 7	
Flatoides humeralis Walk. Granadilla	Coffea arabica	Sept. 10 Oct. 25	
MEMBRACIDAE Aconophora laticornis Walk. Guadalupe San Pedro	Croton gossypifolium	Jan. 15 May 3	Caused serious damage to papaya and avocado, pre- venting the former from blooming.
Aconophora pallescens Stahl Grecia Ocnomogo Paso Ancho Peralta	Acacia cyanophylla Amygdalus davidiana Amygdalus persica Anacardium occidentale	Through- out year	Anacardium rhinocarpus Annona cherimola Bixa orellana Callistemon lanceola- tum



Aconophora pallescens-- Cont'd. San Pedro	C o l l e c t e d o n	Date	Notes
	Calyptanthus costaricensis Carica papaya Cestrum aurantiacum Chrysophyllum cainito Citrus aurantium Citrus limonia Citrus nobilis deliciosa Citrus sinensis Coffea arabica Cydonia oblonga Dovyalis hebecarpa Ficus religiosa Phaseolus vulgaris		
Acutalis fusconervosa Fairm. El Cacao	Hibiscus rosa-sinensis Hymenaea courbaril Lagerstroemia speciosa Malus sylvestris Mangifera indica Pennisetum purpureum Persea americana Persea drymifolia Phaseolus vulgaris Phoebe tonduzii Pouteria caimito Prunus cerasifera Spondias mombin	Nov. 7	
Aethalion quadratum Fowl. Guadalupe Orosi San Jose San Pedro	Persea americana Persea drymifolia Phoebe tonduzii	Feb. 16 to Oct. 5	Causes deformation of avocado branches.
Aethalion reticulatum L. San Pedro	Canarium odoratum Casuarina equisetifolia Erythrina rubrinervia Phoebe tonduzii Terminalia catappa	Jan. 3-19 Apr. 6 July 12 Nov. 20 Dec. 30	
Alchisme grossa Fairm. Guadalupe	Croton gossypifolium Cythomandra betacea Solanum lanceolatum sinuatum	Jan. 24 Feb. 16 June 5	

Antianthe expansa Germ. La Holanda Paso Ancho Peralta San Isidro San Pedro Santa Ana Sarchi Villa Quesada  Bolbonota inaequalis Fab. Coyolar El Cacao Granadilla Orosi Paso Ancho San Pedro  Bolbonota insignis Fowl. Coyolar El Cacao San Antonio San Pedro	C o l l e c t e d o n		Date Through- out year	Notes Especially harmful on pepper plants.
	Acnistus arborescens Capsicum annuum Cestrum aurantiacum Cestrum lanatum Cestrum macropayllum Coffea arabica	Erythrina rubrinervia Nicotiana tabacum Persea americana Solanium aculeatissimum Vernonia brachiata		
	Acnistus arborescens Calea urticifolia Calyptranthes costari- censis Camellia japonica Canarium odoratum Casuarina equisetifo- lia Cinnamomum camphora Citrus limonia Citrus sinensis Coffea arabica Diospyros kaki Dovyalis hebecarpa Eugenia jambos Eugenia uniflora	Ficus religiosa Fortunella japonica Hicoria pecan Hymenaea courbaril Malus sylvestris Mammea americana Mangifera indica Morus rubra Persea americana Persea drymifolia Pouteria cainito Prunus armeniaca Prunus salicina Rosa sp.	Through- out year	
	Calyptranthes costari- censis Casuarina equiseti- folia Coffea arabica Diphyssa robinoides Ficus religiosa Grevillea robusta	Guarea caoba Mangifera indica Morus rubra Persea americana Phaseolus vulgaris Saccharum officinarum	Jan. 3- Nov. 7	

C o l l e c t e d o n			Date	Notes
Campyllocentrus hamifer Fairm. San Pedro	Cheyota edulis Spondias mombin		Aug. 31 Dec. 13	
Cyphonia clavata Fab. Cuesta del Macho Sarchi Villa Quesada Waldeck	Cestrum lanatum Eupatorium odoretum Vernonia brachiata		Feb. 10 March 25- 27 Aug. 14	
Enchenopa lanceolata Stoll Orosi Paso Ancho San Dimas San Pedro	Casuarina equiseti- folia Croton gossypifolium Coffea arabica Cydonia oblonga	Cytisus fragrans Diphysa robinoides Erythrina rubrinervia Hicoria pecan Parkinsonia aculeata	Jan. 10- Nov. 19	
Entylia sinuata Fab. Cuesta del Macho El Cacao Orosi Paso Ancho San Jose San Pedro Villa Quesada	Calcea urticifolia Coffea arabica Coix lachryma-jobi Crotalaria retusa Dahlia rosea Jacobinia coccinea Persea americana Persea drymifolia	Phaseolus vulgaris Vernonia brachiata	Feb. 15 May 28 Sept. 13- Dec. 25	
Erechtia sallaci Fowl. San Pedro	Anacardium occidentale Malus sylvestris Persea drymifolia		June 12- Dec. 26	Injurious to avocado; causes fruit to drop.
Heteronotus nodosus Germ. El Cacao Granadilla Guadalupe San Antonio	Inga paterno		July 2 Oct. 25 Nov. 7	



C o l l e c t e d o n			Date	Notes
Horiola picta Coque. Waldeck	Theobroma cacao		Feb. 13	
Hypsoprora coronata Fab. Orsi	Calea urticifolia		Sept. 13	
Membracis mexicana Guer.	Acnistus arborescens	Erythrina rubrinervia	Through- out year	Seriously damages many plants.
Granadilla	Amygdalus persica	Eugenia uniflora		
Guadalupe	Anacardium occidentale	Hamelia erecta		
Paso Ancho	Aracardium rhinocarpus	Hibiscus rosa-sinensis		
San Dimas	Annona cherimola	Hicoria pecan		
San Pedro	Annona muricata	Hymenaea courbaril		
Waldeck	Callistemon lanceo- latum	Jacobinia coccinea		
	Calyptranthes costari- censis	Lagerstroemia speciosa		
	Camellia japonica	Malus sylvestris		
	Canarium odoratum	Mammea americana		
	Casuarina equiseti- folia	Mangifera indica		
	Citrus limonia	Morus rubra		
	Citrus sinensis	Persea americana		
	Citrus sp. (toronjo)	Phoebe tonduzii		
	Coffea arabica	Pouteria caimito		
	Cydonia oblonga	Prunus salicina		
	Diospyros kaki	Psidium guajava		
	Diospyros virginiana	Pyrus communis		
	Dovyalis hebecarpa	Solanum seaforthianum		
		Terminalia catappa		
Micrutalis albiivitta Fowl. San Pedro	Croton gossypifolium		Dec. 22	
Polyelypta dispar Fowl. Ochomogo	Verbesina turbacensis		June 28	

Collected on		Date	Notes
Polyelyptodes cucullatus Fowl. San Pedro	Diphyssa robinoides	Dec. 13	
	Eupatorium odoratum	March 25	
Popea capricornis Fowl. Cuesta del Macho	Inga edulis	June 28	
Pterygia bituberculata Fowl. San Pedro	Erythrina rubrinervia Indigofera suffruticosa Morus rubra Musa paradisiaca	March 26 June Aug. 30 December	
Spongophorus ballista Germ. Paso Ancho San Pedro Villa Quesada	Codiaeum variegatum Crotalaria juncea Hibiscus rosa-sinensis Persea americana	Jan. 26- Feb. 26 Sept. 16 Dec. 27	
Stictocephala festina Say Coyclar San Isidro San Pedro	Phaseolus vulgaris Tetragonia expansa		
Umbonia crassicornis Am. & Serv. Guadalupe Paso Ancho San Lucas San Pedro	Calliandra grandiflora Enterolobium cyclocarpum Pyrus communis	May 26- July 7	Damages plants by eggs scars.
Vanduzea segmentata Fowl. Orosi Paso Ancho	Acinthus arborescens Byrsonima crassifolia	Sept. 13 Oct. 7	
HYMENOPTERA			
Atta sexdens L. El Cacao	Many species of plants	Sept. 13 to Nov. 22	One of the serious pests of Costa Ri

Atta sexdens---Cont'd.	C o l l e c t e d o n		Date	Notes
Grecia Orosi Santa Ana	Capsicum annuum Chalcas exotica Citrus aurantium Citrus limonia Citrus medica Citrus nobilis de- liciosa Citrus sinensis Coffea arabica Diospyros kaki Dovyalis hebecarpa Ficus <b>religiosa</b>	Hibiscus rosa-sinensis Hymenaea courbaril Impatiens balsamina Malus sylvestris Persea americana Poinsettia pulcherrima Psidium guajava Pyrus communis Schinus molle Sterculia diversifolia Zea mays	Through- out year	Seriously damages trees by cutting twigs, particular avocado and citrus also a household pest.
Solenopsis geminata Fab. Cartago Paso Ancho San Pedro Santa Barbara	Caesalpinia pulcherrima Asparagus officinalis Dombeya wallichii Rosa sp.	Zante deschia aethiopica	Dec. 6 March 13 June	In flowers. In flowers; best pollinator of asparagus.
Trigona amalthaea Oliv. Grecia	Citrus sinensis		Jan. 14	Damages orange by eating flowers and tender foliage.
Trigona cupira Smith San Pedro				
Trigona ruficrus corvina Cr. Escasu				

L E P I D O P T E R A

Agraulis juno Cr. Paso Ancho San Pedro	Passiflora edulis Passiflora ligularis	Apr. 15- May 31	Larvae damage granadilla.
--	---	--------------------	------------------------------



Collected on			Date	Notes
Agraulis poeyi Eutl. San Pedro	Passiflora ligularis		Apr. 3 to March 14	Larvae damage gran- adilla.
Anteos clorinde Godt. Paso Ancho	Musa sapientum		July 29	
Automeris Loucardi Druce Paso Ancho San Pedro	Erythrina rubrinervia Inga laurina Malus sylvestris		Jan. 15 July 6 Nov. 21 to Dec. 27	Defoliates apple in late December.
Automeris rubescens Walk. Guadalupe San Pedro	Cinnamomum camphora Coffea arabica Nephrolepis sp.		Jan. 31 May 29	
Azochis gripusalis Walk. San Pedro	Ficus carica		Jan. 24 to May 2	Seriously injures fig by boring branches.
Ertholdia specularis H. & S. San Pedro	Citrus nobilis de- liciosa Citrus sinensis		Jan. 11 June 7	
Dicentria violacens H. & S. San Pedro	Diospyros virginiana		June 18	Reared on this plant
Dircenna klugii Geyer San Pedro	Solanum lanceolatum sinuatum		Jan. 25	Reared on this plant
Eantis pallida Feld. Ochomogo San Isidro San Pedro	Casimiroa edulis Citrus aurantifolia Citrus aurantium	Citrus limonia Citrus sinensis	Jan. 10 to Dec. 28	Seriously injures citrus.
Ecpanttheria eridane Hbn. San Pedro	Prunus salicina		Nov. 20	Taken ovipositing.

C o l l e c t e d o n			Date	Notes
Euglypnis melancholica Butl. San Pedro	Persea americana		Sept. 20	
Halisdota underwoodi Roth. San Pedro	Cydonia oblonga Citrus sinensis Ficus religiosa		Jan. 5- Aug. 21	
Hemerocampa costaricensis Schaus San Pedro	Mangifera indica Persea americana		Feb. 6 Feb. 16	
Hermionodes porrecta Walk. Guadalupe	Alnus acuminata		Jan. 19 to Apr. 15	Larvae bore in jaul.
Hylesia alinda Druce Guadalupe Paso Ancho San Pedro	Citrus aurantium Lagerstroemia indica Malus sylvestris Pelargonium sp.		Jan. 1- July 13 Nov. 28	Larvae on apple and sour orange.
Hypopyrena colpodes Wlsm. Guadalupe San Pedro	Persea americana Persea drymifolia		Jan. 5 to Dec. 18	Seriously damaging avocado.
Hypsipyla grandella Zell. Coyolar San Pedro	Cedrela glaziovii pub- erula Cedrela montana mexi- cana Guarea caoba		July 2 to Oct. 10	Damages caoba and cedro; a serious pest.
Jocara claudalis Mosch. Alajuela Coyolar El Cacao Guadalupe Paso Ancho San Isidro San Pedro	Persea americana Persea drymifolia		Through- out year	A serious pest of avocado.

Jocara subcurvalis Schauss San Pedro	Persea digampholia	Jan. 5 to Nov. 20	A pest of avocado.
Laphygma frugiperda S. & A. San Pedro	Zea mays	Aug. 7	
Leucoptera coffeella Guer. & Proutt. El Cacaco Granadilla Guadalupe San Antonio San Pedro	Coffea arabica	Jan. 24 to May 14. Oct. 23- Dec. 10	A pest of coffee.
Machimia erythema Wlsm. San Pedro	Persea americana	Feb. 18	Adult emerged from larva on avocado.
Megalopyge costaricensis Sch. <del>Guadalupe</del> San Pedro	Citrus limonia Citrus sinensis Coffea arabica Melus sylvestris	Jan. 10 to June 1	Larva called "gusano de pollo."
Mesocondyla concordalis Hbn. Coyolar San Pedro Santa Ana	Couralea rosea	July 12 to Nov. 22	Damaging this tree.
Papilio anchisiades idaeus Fab. Alajuela Coyolar San Jose San Pedro	Casimiroa edulis Citrus limonia Citrus nobilis de- liciosa Citrus sinensis	Feb. 23 June 5 to Nov. 22	An "orange dog," a pest of importance on citrus.



C o l l e c t e d   o n			Date	Notes
Papilio polyxenes stabilis R. & J. Ochomogo	Anethum graveolens		June 28	
Papilio thoas autocles Roth. San Jose San Pedro	Citrus sinensis Ruta graveolens		June 18 Nov. 28	Reared.
Phobetron hipparchia Cr. San Pedro	Citrus sinensis Coffea arabica Hymenaea courbaril Lagerstroemia speciosa	Malus sylvestris Persea americana Vernonia brachiata Vitis vinifera	Apr. 30 July 18 to Nov. 28	Defoliates small trees.
Plutella maculipennis Curt. San Pedro	Brassica oleracea capitata		Apr. 5	Very abundant on cabbage.
Sibine apicalis Dyar Guadalupe San Pedro	Citrus sinensis Taetsia fruticosa		Feb. 5	Larvae collected on dracena Nov. 27. Adult emerged Feb. 5.
Stenomona anonella Sepp. Coyolar San Dimas San Pedro	Annona cherimola Annona muricata Annona squamosa		July 24 to Sept. 17	Destroys fruit.
Stenomona sororia Zell. Paso Ancho San Pedro	Persea americana Persea drymifolia Phoebe tonduzii		Jan. 5 to Dec. 25	A serious pest of avocado, particu- larly to young grafts.
Tincola uterella Wlsm. San Pedro	Household goods		Through- out year	A clothes moth.

## ORTHOPTERA

Collected on			Date	Notes
Coccothotus rarus Rehn San Pedro	Amygdalus persica Annona squamosa Citrus grandis Citrus nobilis de- liciosa Citrus sinensis Coffea arabica Malus sylvestris	Passiflora ligularis Pelargonium zonale Saccharum officinarum Tactesia fructicosa Trichopilia suavis Zantedeschia aetheo- pica Zea mays	Through- out year	Eats leaves and tender stems of a wide variety of plants; also damages plants by ovipositing slits; also a pantry pest.
Conoccephalus cinereus Thunb. El Cacao San Pedro	Panicum barbinode Phaseolus vulgaris Rosa sp.	Tetragonia expansa Tripsacum laxum	May 24 Nov. 7 to Dec. 27	A tettigoniid; es- pecially harmful on grasses.
Ellipes minuta Scudd. El Cacao San Pedro	Capriola doctylon Capsicum annuum Fragaria chiloensis	Persea americana Phaseolus vulgaris Tetragonia expansa	Jan. 9 Oct. 5 to Dec. 27	
Insara intermedia Bruner Coyolar Guadalupe San Pedro	Acalypha sp. Casuarina equiseti- folia Citrus aurantium Hibiscus rosa-sinensis	Malus sylvestris Musa paradisiaca Rumex crispus	Jan. 10 to Sept. 18 Dec. 13 Dec. 31	Harmful.
Neoxabea bipunctata DeG. San Pedro	Amygdalus persica Persea americana	Persea drymifolia	Jan. 18 June 4	A gryllid.
Panchlora cubensis Sauss. San Pedro	Coffea arabica Zea mays		Oct. 1 to Nov. 13	A green roach.
Paratettix mexicanus abortus Hancock San Pedro	Galinsoga hispida		Aug. 30	Acridid.





# THYSANOPTERA

Collected on		Date	Remarks
Gynaikothrips uzeli Zimm. El Cacao	Ficus nitida	Nov. 12	Caused damage to fruit subject to dissection after.
Liothrips zeteki Hood Paso Ancho San Pedro	Persea americana Persea drymifolia	Jan. 9 to March 27	A series of avocados, particularly, to newly budded stock.
Selenothrips rubrocinctus Giard Peralta	Mangifera indica	Aug. 20 to Dec. 27  Feb. 14	

## DERMAPTERA

Doru lineare Esch. Santa Ana	Oryza sativa Zea mays	Nov. 22	
---------------------------------	--------------------------	---------	--

## THE MORE IMPORTANT RECORDS FOR JUNE 1935

Hatching of grasshopper eggs in the Great Plains was very much retarded by cool, wet weather. The infestation in general is not nearly so serious as last year.

Rather extensive bands of Mormon crickets are moving toward cultivated areas in Moffat County, Colo., and a very extensive infestation is reported over the greater part of southern and central Idaho.

Cutworms were extremely destructive in the East Central, West Central, and Great Plains States. These insects were also reported from southern California.

Armyworm outbreaks occurred in the South Atlantic, East Central, and West Central States during the month.

General outbreaks of the alfalfa looper were reported from the Willamette Valley of Oregon and also from southwestern Colorado.

The Japanese beetle began to emerge in southern New Jersey the third week in June. This is decidedly later than usual.

The chinch bug outbreak in the East Central and West Central States was very materially reduced by cool, wet weather during the month. In part of the area the infestation was negligible.

The spring brood of the hessian fly was unusually heavy in the East Central States, with a general increase in populations westward to Kansas.

The European corn borer came through the winter normally over the greater part of its range.

The alfalfa weevil is more serious in Colorado than in any previous year. This insect is also abnormally abundant in Idaho, from moderate to heavy infestations are being reported from Utah, and light infestations from California.

Heavy infestations of hairy vetch by the vetch bruchid are reported from the Carolinas. This insect was also reported from Maryland and Pennsylvania.

The codling moth was generally retarded along the Atlantic seaboard, and over the greater part of the country infestations were reported as extremely light. From Colorado westward infestations were reported as heavier than in the East.

Egg laying by the first generation of the plum curculio was observed during the third week in June in the Fort Valley section of Georgia. Present indications are that there will be a heavy second brood this year in this section. In the Northern States this insect is comparatively scarce.

Although the oriental fruit moth is quite generally reported as scarce in the Eastern States, an unusually heavy infestation was reported from Mississippi.

The seed corn maggot, the cabbage maggot, and the onion maggot were destructively abundant in a number of localities in the Eastern and Central States. These outbreaks were associated with cool, wet weather.

From South Carolina to Kansas and southward blister beetles were unusually troublesome on a wide variety of truck and flower-garden crops.

The corn ear worm is occasioning more than the usual amount of damage in the Southern States and adults were observed as early as June 12 at Marietta, Ohio.

The Mexican bean beetle emerged about 2 weeks later than usual in the New England and Middle Atlantic States. By the end of the month this insect was generally destructive throughout its range.

Heavy infestations of peas by the pea aphid are reported from Connecticut and New York westward to North Dakota and southward to Mississippi.

The carrot beetle is appearing in destructive numbers from Michigan and Minnesota southward to Missouri and Kansas.

The pepper weevil, which was discovered in Manatee County, Fla., in May was reported as increasing and to have destroyed 80 percent of the crop in certain fields at the end of June.

The boll weevil is reported generally over the South Atlantic and Gulf States. The infestations are rather spotted throughout the entire area.

The beet armyworm is seriously attacking cotton in Arizona, New Mexico and western Texas.

The cotton leaf worm infestation was so heavy by the middle of June in the Gulf coast area of Texas that poisoning operations were necessary.

Unusually heavy infestations of the forest tent caterpillar are reported from the New England States westward to Minnesota.

An extensive outbreak of bagworms was reported from Tennessee and Alabama.

Severe infestations of larch by the larch case bearer were reported throughout New England.



# THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA FOR MAY AND JUNE 1935

Cool, moist weather in the Prairie Provinces during May delayed the hatching of grasshopper eggs. The earliest hatching of the lesser migratory grasshopper and the two-striped grasshopper in Manitoba and of the lesser migratory grasshopper in Saskatchewan commenced about the end of the third week in May. Hatching of the roadside grasshopper in these two provinces started at the end of May. Up to the middle of June general cool, moist weather further delayed development, damage to crops was slight, and poisoning operations were limited. In Alberta, grasshoppers were reported just beginning to hatch in the first week of June and by mid-June they were abundant in only a few localities and had caused no damage. By June 25, light damage to crops was becoming evident in some localities in the three provinces, but was being held in check by poisoning. The grasshoppers are still a serious potential danger if the weather turns hot and dry, but the farmers are well organized to combat them. Hatching of the roadside grasshopper in the Kamloops district of British Columbia started on May 10 and was 75 percent complete by the end of May.

The pale western cutworm, which has been in outbreak form over much of southern and central Alberta and Saskatchewan during the past several years, is again active in many sections, causing quite severe damage to spring wheat, particularly in the drier areas of the two provinces.

Cutworms of various species are unusually prevalent and abundant in southern Quebec and Ontario and are causing material damage, particularly to garden and truck crops.

Injury by wireworms is very general and unusually serious in Saskatchewan, especially in districts of medium and light soils. These insects are also generally abundant in southern Alberta, causing losses to grain and corn. Some damage to corn is occurring locally in southern Manitoba. Injury to tobacco crops by wireworms has been reported from Ontario.

Extensive and heavy flights of June beetles occurred in Ontario. The beetles caused much injury to the foliage of forest and shade trees and ornamentals.

Sod webworms are damaging spring grains and pastures in sections of southern Ontario.

Severe infestations of flea beetles have been reported on cruciferous crops in parts of southern British Columbia.

A very low winter mortality of the codling moth is indicated in southern Ontario and with favorable weather conditions the species will probably be an important pest this season. Emergence of adults began in the Niagara district on May 25.

Indications are that the San Jose scale is more widespread in southern Ontario than at any time since 1917.

Eggs and young mites of the European red mite were greatly reduced by natural control factors this spring in the Annapolis Valley, Nova Scotia. The species is attracting the attention of growers in sections of the Okanagan Valley, British Columbia.

The eye-spotted budmoth appears to have decreased in many orchards in the Annapolis Valley.

The oblique-banded leaf roller is increasing again in the Victoria district, British Columbia, after being at a low ebb for several years.

The European apple sucker threatens to be more abundant than during the past few years in some Nova Scotia orchards.

The spring brood of moths of the oriental fruit moth commenced emerging about 1 week later than in 1934, in the Niagara district, Ontario.

Tent caterpillars have been reported prevalent in many sections of Eastern Canada, and in British Columbia.

The outbreak of the satin moth in the area between Seton lake and the town of Lillooet, in British Columbia, appears to have been definitely checked by the introduced parasite Apanteles solitarius Ratz.

Increased intensity of the outbreak of the larch case bearer, which has been general in Eastern Canada for several years, is reported from New Brunswick and Ontario.

Troublesome infestations of the elk or winter tick on moose, deer, cattle and horses have been reported in sections of the Maritime Provinces, Saskatchewan, and Alberta.



## GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

United States. P. M. Annand (June 10): The hatching of grasshopper eggs in the severely infested northern Great Plains States has been greatly retarded by unfavorable weather but has resulted in little or no mortality. Hatching is now in progress in these States and is nearly completed in Michigan and Wisconsin, where the use of poisoned bait will be started within a few days. Some rather heavy reduction in infestation has occurred in the Dakotas as a result of the attack of beetle larvae, which are predacious on the eggs. The infestation in general is not nearly so serious as last year and is limited to the areas not completely baited last year or where infestation was increased by migration from outside areas. Extensive control operations have been under way in California for some weeks, the most serious outbreaks in the State being limited to Imperial and San Diego Counties in the south and to Siskiyou County in the north.

Maine. H. B. Peirson (June 12): Severe injury to 20 acres of corn and hay at East Baldwin, in Cumberland County, reported.

Vermont. H. L. Bailey (June 24): Grasshoppers, chiefly Melanoplus mexicanus Sauss., reported as abundant in the Connecticut River Valley in Windham County. Very few found on investigation in Connecticut Valley district of Orange County, where grasshoppers have been extremely abundant in previous outbreaks.

Georgia. O. I. Snapp (June 7): Grasshoppers, principally M. femur-rubrum DeG., caused considerable damage to a peach crop at Thomaston early in June.

Wisconsin. E. L. Chambers (June 20): A survey made during the past week showed that the M. mexicanus that hatched 3 weeks ago were pretty well thinned out by cold, wet weather, but Camnula pellucida Scudd. was present everywhere in the light sandy areas and pastures, and averaged as many as 150 hoppers per square yard. Most of them were a few days old, and 90 percent of the eggs had hatched by June 12.

Minnesota. A. G. Ruggles (June 21): Grasshoppers are just beginning to hatch. They are moderately abundant.

North Dakota. J. A. Munro (June 23): The hatch of grasshoppers is about 5 to 6 weeks later in the season than for 1931. On a State-wide trip, which I have just made, I observed that most of the hoppers now hatched are in the first and second instars and are remaining in their hatching areas because of the luxuriant growth of grasses. Poisoning operations are under way in areas requiring attention.



F. D. Butcher (June 18): In Pembina and Walsh Counties from 20 to 70 percent of C. pellucida have hatched; higher percentages of M. bivittatus Say, some of which are now in second instar; and a few M. mexicanus are in second instar.

South Dakota. H. C. Severin (June 20): The spring was cold and wet over most of the State and only three reports of grasshopper damage have been received. Eggs are still hatching.

Iowa. C. J. Drake (June 24): Grasshoppers have been hatching in considerable numbers in western Iowa this spring. In comparison with former years the hatches are rather late. The nymphs of the two-lined grasshopper are largely in the third and fourth instars. The infestation is quite spotted, and many farmers are using commercially prepared poisoned-bran mash.

Kansas. E. T. Jones (June 29): In most of the fields grasshoppers were comparatively rare. One field in Lyon County proved to be an exception. In this field 155 M. bivittatus nymphs in about the third instar and 2 M. femur-rubrum adults were taken in 50 sweeps. Less than 5 grasshoppers were taken in any other field swept.

Colorado. G. M. List (June 22): Grasshoppers have hatched in moderate numbers in a number of counties. Poisoning will be necessary in limited localities but present indications are that there will be no large areas involved.

Texas. F. L. Thomas (May): The county agent reports that grasshoppers are more abundant in the lowlands in the southern part of Dallas County than they have been during the last 5 or 6 years.

Utah. G. F. Knowlton (June 17): Grasshoppers are, in general, less damaging this spring than usual.

C. J. Sorenson (June 19): C. pellucida is very abundant near Annabella, in Sevier County.

Oregon. W. R. Walton (June 12): C. pellucida began hatching in northern part of Klamath County on May 20 or 21. Most of the eggs had hatched and the hoppers were just beginning to feed on grasses on May 22. Hatching was a month later than in 1934.

#### MORMON CRICKET (Anabrus simplex Hald.)

Colorado. G. M. List (June 22): The Mormon cricket is quite numerous in the Blue Mountain area in western Moffat County. Several large bands have begun to move toward the cultivated areas. Control will be necessary to protect some of the crops.

Idaho. C. Wakeland (June 22): The first adults of the Mormon cricket were observed on June 12. In the warmer, lower areas of the State most of

them are now in the adult stage and mating has begun. The infestation is much more extensive this year than at any time during the present outbreak. We know there are crickets in 20 counties in southern and central Idaho. Crickets are showing a different tendency in migration this year. They are working down more to the desert areas. Some very large groups have left the foothills and have migrated miles into the open desert, where there is no green food or moisture.

Oregon. D. C. Mote (June): Mormon cricket found at Pendleton, Umatilla County.

#### CUTWORMS (Noctuidae)

Vermont. H. L. Bailey (June 24): Cutworms of several species continued unusually abundant and caused much damage.

Ohio. T. H. Parks (June 25): Cutworms became troublesome the last week in May and continued to devour early garden crops during the first 10 days of June. The principal species involved fed on the foliage at night, instead of cutting off the stems.

B. J. Landis (June 24): On June 17 the first moths emerged from pupae at Columbus. Cutworms continued to be injurious during the first 2 weeks of June.

E. W. Mendenhall (June 12): The climbing cutworms Rhynchagrotis alternata Grote are very serious on garden crops in central Ohio this spring, causing a good deal of destruction to tomatoes, cabbage, and potatoes.

Indiana. J. J. Davis (June 25): Climbing cutworms were reported to be damaging apple buds at Notre Dame on June 4.

Michigan. R. Hutson (June 11): Cutworms have been reported from all over the State in unusual numbers. (June 19): Trouble from all kinds of cutworms is continuing.

Wisconsin. E. L. Chambers (June 20): Severe outbreaks of cutworms occurred on light sandy fields plowed this spring and planted to corn, tomatoes, and small grains. Many large fields of corn and oats were almost completely destroyed and corn had to be replanted in many counties in the south and central parts of the State. County-wide control campaigns were conducted in eight counties.

C. L. Fluke (June 22): Severe damage by cutworms to tobacco and sugar beets in Dane County. In 92 hills of tobacco in one field an average of 7 cutworms per hill was found.

Minnesota. A. G. Ruggles (June 21): Feltia ducens Walk. and a species of Euxoa have been on a rampage all over the State. Fields of corn have been destroyed and flax, onions, soybeans, and hawthorn raspberry have



been badly attacked. The ordinary garden cutworm has also been fairly abundant.

A. A. Granovsky (June 21): Many crops, especially the truck crops and the flower gardens, suffered from several species of cutworms. Agrotis c-nigrum L. and Lycophotia margaritosa saucia Hbn. are the species most commonly found associated with this damage.

North Dakota. J. A. Munro (June 18): Cutworms are reported damaging barley in Sheridan County. Cornfields in southeastern counties are being attacked so severely that some replanting is necessary.

South Dakota. H. C. Severin (June 20): Cutworms are still doing an unusual amount of damage generally, attacking gardens, truck crops, and corn.

Iowa. C. J. Drake (June 24): Cutworms are unusually abundant this spring. Considerable numbers may still be found in gardens and cultivated fields. The variegated cutworm (L. margaritosa saucia) is doing considerable damage in alfalfa and clover fields.

Missouri. L. Haseman (June 26): A considerable infestation of the yellow-striped cutworm (Prodenia ornithogalli Guen.) took place early in the month.

Oklahoma. F. A. Fenton (June 24): An outbreak of the variegated cutworm developed in alfalfa fields in the extreme northeastern corner of the State. The two-lined cutworm (P. ornithogalli) is present in about normal numbers and is causing extensive damage to stands of cotton, corn, and melons. It also feeds on beans.

Utah. C. J. Sorenson (June 19): Pale western cutworms (Porosagrotis orthogonia Morr.) are moderately abundant in dry-land wheat in Cedar Valley, in Utah County, and on Levan Ridge, in Juab County.

S. R. Boswell (June 11): During the last 2 days cutworms have completely cleaned up the cornfields around Joseph and Elsinore. These worms are of the type that works under ground and farmers did not know of their existence until entire patches of corn were gone.

California. H. J. Ryan (June 24): During the week ended May 18 the variegated cutworm was noted damaging citrus, alfalfa, and tomatoes in different parts of Los Angeles County.

#### ARMYWORM (Cirphis unipuncta Haw.)

Maine. H. B. Peirson (June 22): Several moths were noticed at Bar Harbor on May 11 and 13.

Maryland. E. N. Cory (June 22): An outbreak is occurring in Baltimore County. Adults were found flying in the vicinity of College Park on



June 9 and 10, and one larva was collected at College Park on the latter date.

- Virginia. W. J. Schoene (June 20): Armyworms were found on June 9 in Wythe County, where they were causing serious injury to newly planted corn and small grains.
- Ohio. T. H. Parks (June 24): An armyworm outbreak was reported from Butler County on June 18. This report was followed closely by reports from Madison and Marion Counties. Yesterday the insect was reported to be injuring corn in Franklin and Mahoning Counties. The path of the outbreak extends from southwest to northeast across the State. Many larvae bear parasite eggs.
- Indiana. J. J. Davis (June 25): Numerous armyworm outbreaks have been reported from all sections of the State. The first report came from Cannelton, in the extreme southern part of the State and others have been received from all sections to the extreme northern part. In most instances wheat heads are being attacked, although in some fields the worms have gotten into the corn and are damaging it. All specimens that have been sent to us bear numerous tachinid eggs.
- Illinois. W. P. Flint (June 21): Heavy flights of moths during May have resulted in moderate to severe outbreaks throughout the State.
- Kentucky. W. A. Price (June 22): Scattered armyworm outbreaks occurred in central and western Kentucky. Little damage was done and practically all worms had disappeared by June 16.
- Iowa. C. J. Drake (June 17): Armyworm outbreaks started on June 14 in Fremont and Mills Counties. The county agent of Fremont County reports that there are armyworms in every township. The county agent of Mills County stated that over 600 acres of rye and wheat near Glenwood and Malvern were infested. (June 24): Southern Iowa is rather heavily infested with armyworms.
- Missouri. L. Haseman (June 26): The regular midsummer brood of armyworms has swept most of the State. This week they are maturing in the southern half of the State but complaints regarding them are still coming in from the more northern districts.
- Kansas. H. R. Bryson (June 25): True armyworms have been quite abundant and have done some damage.
- Oklahoma. F. A. Fenton (June 24): An outbreak of the armyworm occurred in wheat in the extreme northeastern corner of the State. Considerable damage was done to wheat and barley in many fields, especially those on bottom lands. This outbreak was first noted on May 13 and apparently most of the worms disappeared early in June.

### ALFALFA LOOPER (Autographa californica Sneyer)

Colorado. G. M. List (June 22): There is a very general and rather heavy outbreak throughout the southern and western parts of the State. In some areas truck crops, especially head lettuce, are being severely injured. Peas and sweetclover seem to be favorite hosts. In some of the orchard sections the loopers are migrating from these crops to fruit trees.

Oregon. D. C. Mote (June): Caterpillars are very abundant and are damaging seedling alfalfa, Austrian peas, beans, squash, corn and other crops in the Willamette Valley.

L. P. Hockwood (June 18): A general outbreak, particularly in red clover, is in progress in Washington County. The northern part of the county is most seriously affected. As the hay crop is taken off the worms eat down the small amount of green residue and second growth. The most serious damage is to adjacent corn and lima beans, to which the worms migrate after the hay is removed. One field of seed onions adjacent to hay was being seriously damaged. The worms preferred the onion leaves but, as there were few of these, they were feeding on the seed stalks, weakening them and causing loss of seed heads. Grass and grains, including wild oats, are not attacked. There was considerable feeding on the late green pods of common hairy vetch in one field, but smooth vetch in the same field was apparently not damaged.

### SALT-MARSH CATERPILLAR (Estigmene acrea Drury)

Oklahoma. F. A. Fenton (June 24): Three species of woolly worms have been unusually numerous this past spring--Isia isabella S. & A., Diacrisia virginica Fab., and Estigmene acrea Drury. These caterpillars caused severe injury to cotton seedlings and to corn and melon crops, destroying stands. They fed on ripening peaches and tomato fruits, but not on tomato foliage. Legumes, beans in particular, were being injured by the worms eating the blooms and pods. The salt-marsh caterpillar was unusually abundant on sweetclover. This species comprised about 90 percent of the population and at present it is being wiped out by some disease.

Texas. H. J. Reinhard (June 22): Full-grown larvae of the salt-marsh caterpillar are common in cornfields, where they are feeding on silks. This insect has also been noted as seriously damaging chrysanthemum plants.

### WHITE GRUBS (Phyllophaga spp.)

Maine. H. B. Peirson (June 22): The first flight of May beetles at Bar Harbor occurred on May 27, following two warm days.

New Hampshire. L. C. Glover (June 8): June beetles are beginning to be more numerous now, although the first flight was reported on May 29.



- Maryland. E. H. Cory (June 22): May beetles have been doing considerable damage in various localities in the State. They stripped many pin oaks in Montgomery and Frederick Counties and nearly stripped one very large white oak in Montgomery County. They have been reported as feeding heavily on cherry, elm, and oak.
- Kentucky. W. A. Price (June 22): May beetles have been difficult to obtain this season. Excessive rainfall and low temperatures in the evening have made flights irregular and light.
- Michigan. R. Hutson (June 11): Various species are emerging in numbers throughout the Lower Peninsula.
- Wisconsin. E. L. Chambers (June 20): Serious losses from white grubs have been observed at several of our larger nurseries in northern Wisconsin to evergreen seedlings that had not been treated. Reports of injury to corn and garden crops have also been received from Fond du Lac, Waushara, Vernon, and La Crosse Counties.
- C. L. Fluke (June 22): The predominating species are P. hirticula Knoch, P. fusca Froel., P. rugosa Melsh., and P. tristis Fab. Others less numerous are P. ilicis Knoch, P. implicita Horn, and P. balia Say. Flights have been steady since May 23, except for a cold rainy period from June 14 to 20. Most species are now laying eggs. Bur oak trees are stripped throughout southwestern Wisconsin.
- Minnesota. A. A. Granovsky (June 21): Damage from white grubs is not noticeable, although brood C grubs are common. The June beetle flight was heavy, especially in the southeastern section of the State, where many wood groves are badly defoliated. P. fusca, P. rugosa, P. implicita, P. futilis Lec., P. drakei Kby., and P. anxia Lec. are fairly common, although not over the entire area.
- North Dakota. J. A. Munro (June 18): White grubs at Selfridge and Fargo. Adults began flying at Fargo on June 2.
- Iowa. C. J. Drake (June 24): Adults are still emerging and defoliating trees. Over 15 species have been collected.
- Kansas. H. R. Bryson (June 27): May beetles reported defoliating Chinese elm at Herington.
- Oklahoma. F. A. Fenton (June 24): The peak catch at the trap light was from May 7 to 12, inclusive, when 1,750 specimens were taken. The maximum catch was 646 on May 12. Populations for June are very small so far, a maximum of 78 being taken on the 8th.

#### JAPANESE BEETLE (Popillia japonica Newm.)

- New Jersey. C. H. Hadley (June 27): Owing to cool weather in the spring, the immature forms of the Japanese beetle have been retarded in their



development and the emergence of adults is later than normal. The first beetle in the vicinity of the Moorestown laboratory was found on June 17, a week later than in 1934. They have been coming out slowly since then and are now present in small numbers. In the older infested area a high percentage of diseased larvae have been found in the soil, but this disease has not yet been found in several newly infested areas where soil surveys have been made.

Delaware. L. A. Stearns (June 17): First adult observed at Wilmington.

ROSE CHAFER (Macrodactylus subspinosus Fab.)

New York. N. Y. State Coll. Agr. News Letter (June): Rose chafers were being reported in injurious numbers in orchards in the Hudson River Valley and in the Great Lakes district the last week of the month.

New Jersey. C. H. Hadley (June 20): The rose chafer was first observed June 10 on roses at Moorestown and is now common.

Delaware. L. A. Stearns (June 5): First adults observed on June 5 at Newark.

Maryland. E. N. Cory (June 22): A decided pest in Anne Arundel, Baltimore, and Dorchester Counties. It is feeding on trees and flowers.

North Carolina. C. H. Brannon (June 15): This insect is present in large numbers over the State and is causing serious damage in apple orchards in several mountain counties.

Michigan. R. Hutson (June 25): Rose chafers are causing considerable annoyance in the vicinities of Shelby and of Topeka.

WIREWORMS (Elateridae)

Minnesota. A. G. Ruggles (June 21): Wireworms are moderately abundant in peat soil particularly.

A. A. Granovsky (June 21): This is a year of heavy wireworm damage. Corn, onions, and nursery plantings suffered in many sections of the State, especially where crops were growing on peat soil.

North Dakota. J. A. Munro (June 18): Wireworms are damaging wheat and corn at Mott, Hanks, Hazen, and Baker. In some instances whole fields have been destroyed.

South Dakota. H. C. Severin (June 20): More than the usual damage by wireworms has been done to corn and wheat this spring.

Nebraska. M. H. Swenk (June 14): Injury to planted corn seeds and corn roots by Melanotus sp. was reported from Cherry County the second week in June.

Kansas. H. R. Bryson (June 27): Melanotus sp. was reported to be injuring potatoes and tomato plants in a garden at Peru on June 18.

Wyoming. C. L. Corkins (June 10): Wireworms are destroying bean seedlings in many fields in Big Horn County and wheat in Park County.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT AND OTHER SMALL GRAINS

#### CHINCH BUG (Blissus leucopterus Say).

United States. P. N. Annand (June 19): Weather during the past few weeks has further reduced the chinch bug infestation over the Corn Belt States. Although bugs still occur in threatening numbers in some places, the infestation has been so reduced by rain that it is general only in limited areas, and in some States, including Kansas, Nebraska, and Wisconsin, the infestation had been reduced to the point where very little damage is expected. In Ohio and Indiana, however, the infestation is still threatening, and latest reports from Missouri indicate that fairly high populations still occur in that State and it is expected that some bugs will migrate to corn. Infestation in Illinois has been so reduced that, with a continuation of present weather conditions, only relatively minor damage to corn is expected. Damage to small grains has not been general, although in some areas, particularly in Iowa, isolated fields of barley show rather severe damage.

North Carolina. C. H. Brannon (June 22): The chinch bug is seriously damaging several fields of corn in Anson, Chatham, and Pitt Counties.

South Carolina. F. Sherman and W. C. Nettles (June 21): A number of outbreaks have been reported in the northeastern third of the State, in corn adjacent to small grains.

Ohio. T. H. Parks (June 25): The daily rains between June 15 and 24 helped greatly to control the chinch bugs. Apparently there is not much of a problem ahead for central and western Ohio counties, where the eggs have not yet hatched and the wheat will be cut in 10 days. Around Wooster and elsewhere in northeastern Ohio, the situation still remains serious. Wheat harvest is from 2 to 3 weeks away and many eggs are ready to hatch. Two weeks of dry weather will probably bring on an outbreak.

Indiana. J. J. Davis (June 25): The anticipated outbreak of chinch bugs has not materialized. During the week beginning June 16 heavy rains were prevalent throughout the State, materially aiding the development of fungus and also destroying many of the young bugs. There are still plenty of old bugs in small-grain fields, particularly in the central and eastern parts of the State.



Illinois. W. P. Flint (June 21): Chinch bugs were reduced to light or moderate numbers throughout the infested area. No damage to small grain is anticipated in the southern third of the State. From light to moderate damage in the northwest fourth of the State is possible. Old bugs in all areas are leaving small grain and flying to corn, and some are ovipositing in corn.

Wisconsin. E. L. Chambers (June 20): Continuous cold heavy rains have apparently held the chinch bugs in check everywhere. No young bugs have hatched. All indications point to very little damage to small grains and almost a week of rain and cloudy weather to date may also eliminate any great danger to corn.

Minnesota. A. G. Ruggles (June 21): Chinch bug adults are fairly well distributed but no nymphs have been found.

Iowa. C. J. Drake (June 24): The chinch bug infestation is quite spotted and is heaviest in the western part of the State. Throughout the central and southern parts of Iowa winter mortality was very high, in some counties running over 90 percent. In Henry, Jefferson, and Washington Counties the white fungus disease killed many bugs. The spring has been too cold for the adults to lay the normal number of eggs. In some fields the infestation still runs as high as 50 adults per linear foot of drill row of small grain. The heavy growth of foxtail and other summer grasses will probably be sufficient to hold the nymphs in many fields until they attain the imago stage.

Missouri. L. Haseman (June 26): With the continued rainfall the chinch bug has not been able to develop normally; in fact, with each succeeding rain it has been losing ground in the State. At the present time there is one center of slightly heavier infestation in north-central Missouri, a second in the northwestern part, and a third in the west-central part, but in none of these areas is the situation particularly alarming.

Kansas. H. R. Bryson (June 27): Chinch bugs are scarcer in Kansas than they have been at harvest time for several years. Very few old or young bugs can be found. Some eggs are present.

Oklahoma. C. F. Stiles (June 21): The chinch bug situation is greatly improved. The infestation ranges from a trace in some counties to an average of three per linear foot of drill row. Heavy rains have fallen through the northeastern grain belt of the State during the past 48 hours and I doubt that there will be any migration.

#### HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (June 25): Hessian fly is quite abundant in the wheat crop almost ready to be harvested. Abundance of rains late in May and the first 3 weeks of June have brought this pest to the front very rapidly. The situation was quite satisfactory last fall, with very little infestation. Now the insect is very abundant and there are many



broken stems in some wheat fields. Our annual wheat-insect survey will start in southern Ohio this week.

Indiana. J. J. Davis (June 25): An unprecedented outbreak of the spring brood of the hessian fly has covered the State of Indiana, and is probably most severe in the central part of the State. In some localities wheat has been killed outright, as in Boone County, where perhaps one-third of the wheat fields have been destroyed. Many other fields are beginning to show damage from lodging. The heavy spring infestation is owing in a few instances to early sown wheat, but in general to the large amount of volunteer wheat that developed in waste land and elsewhere last fall.

Illinois. W. P. Flint (June 21): The spring brood of the hessian fly has been unusually heavy, resulting in from light to moderate damage in the wheat areas of the State.

Missouri. L. Haseman (June 26): There has been a rather definite pick-up in the abundance of hessian fly. It is attributed to the favorable weather of the past fall and to the large acreage of wheat seeded early for pasture. The pest is more abundant in the southern half of the State.

Kansas. H. R. Bryson (June 27): Observations made in southeastern Kansas by R. E. Painter indicate that the hessian fly is very abundant in the vicinity of Parsons.

#### BLACK GRAIN-STEM SAWFLY (Trachelus tabidus Fab.)

Pennsylvania. E. J. Udine (June 13): Adults have been flying in abundance the last few days throughout most of western and south-central Pennsylvania. Adults are still flying in abundance in fields near Red Lion, in York County, but are becoming scarce in western Franklin County where larvae are already in the first instar.

Virginia. J. S. Pinckney (June 20): Hibernating larvae of the black grain-stem sawfly were found in wheat stubble in Campbell County. About 2-percent infestation was noted in the fields examined.

Ohio. J. S. Houser (June 8): On June 4 adults were abundant in wheat and rye in Mahoning County. Oviposition in wheat was observed near North Lima on June 8. Eighty-seven adults were captured in a field of wheat near Ellsworth by making one hundred sweeps of a sweep net 15 inches in diameter. Losses in this area will probably be heavy this year.

#### A WHEAT-STEM SAWFLY (Cephus pygmaeus L.)

Pennsylvania. C. C. Hill and E. J. Udine (June 12-13): Adults are flying abundantly in wheat fields near Williamsport, in Lycoming County, and at Red Lion, in York County.

CORNEUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

General. A. M. Vance (June): Past winter conditions have been generally favorable to the hibernating corn borer and the natural mortality appears to be about normal. The spring development in Accomac and Northampton Counties, Va., was more advanced than in any other section of the United States where the insect is known to occur. It appears certain that at least two generations of the borer can be expected annually on the Eastern Shore. Early Irish potatoes, which are grown extensively in this region, may serve as an important host plant for the first-generation borer before the main corn crop, which is planted between rows of potatoes after their first cultivation, becomes available for borer infestation.

Vermont. H. L. Bailey (June 24): In western Vermont the first pupae were found in the field on June 9 and the first adult on June 23.

Connecticut. N. Turner (June 24): The European corn borer was very late in emerging. Eggs are still found in the field and larval injury is just appearing on corn. Injury is apparently as severe as in 1934.

LESSER CORN STALK BORER (Elasmopalpus lignosellus Zell.)

South Carolina. W. C. Nettles (June 21): The lesser corn stalk borer is prevalent over the State, attacking beans.

Florida. J. R. Watson (June 20): Many complaints were received of the depredations of the lesser corn stalk borer, and some concerning those of the larger corn stalk borer (Diatraea crambidoides Grote), but the infestation was not nearly so severe as 2 years ago.

Mississippi. C. Iyle (June 22): Inspector G. L. Bond reported a severe infestation of the lesser corn stalk borer in George and Jackson Counties, one farmer estimating a loss of more than 200 bushels of corn. Eighty-five percent of a field of peas had been killed and sugarcane had also been damaged severely. A farmer in George County had hauled out two wagon loads of corn that had broken off at the ground. No complaints have been received from other sections of Mississippi.

SOD WEBWORMS (Crambus spp.)

Indiana. J. J. Davis (June 25): A sod webworm, Crambus sp., was reported as destructive to corn in central Indiana and as far north as La Porte County. The inquiries concerning it were received during the last 2 weeks in June.

Michigan. R. Hutson (June 19): C. caliginosellus Clem., the corn root webworm, was found injuring corn at Mason on June 18.



SUGARCANE BEETLE (Euethola rugiceps Lec.)

North Carolina. C. H. Brannon (June 13): The rough-headed corn stalk beetle is causing rather serious damage to corn in Currituck County.

Georgia. T. L. Bissell (June 5): An upland field of 5 acres of corn at Experiment has been damaged 75 percent. Beetles have apparently left the field but have just begun to injure nearby bottom-land corn that is 2 weeks old.

Tennessee. G. M. Bentley (June 11): Adult beetles are doing serious damage in several cornfields in the central part of Tennessee.

Alabama. J. M. Robinson (June 20): Reported as damaging young corn about knee high at Ranburne, in Claburne County.

SOUTHERN CORN ROOT WORM (Diabrotica duodecimpunctata Fab.)

Kentucky. W. A. Price (June 22): The southern corn root worm has extensively damaged corn in sections of central and western Kentucky.

North Carolina. C. H. Brannon (June 20): Root worm damage to young corn is very prevalent in eastern North Carolina. Several fields in the mountains in Macon County are also badly damaged.

A CORN SILK BEETLE (Luperodes varicornis Lec.)

Mississippi. C. Lyle (June 22): Considerable damage to ears of corn by the corn silk beetle was reported by inspector M. D. Peets of Bogue Chitto on June 18 and by a correspondent at Waynesboro on the same date.

CORN BILLBUGS (Calendra spp.)

Iowa. C. J. Drake (June 24): Several species of corn billbugs have damaged a few fields of corn in Monona, Harrison, and Fremont Counties. The clay-colored billbug (C. aequalis Gyll.) is doing some damage in wheat fields in Fremont County. The adults were feeding on the kernels of grain and in one large field about  $1\frac{1}{2}$  rods of wheat along one side (80 rods long, had been almost totally destroyed. In an adjoining cornfield this and another species of billbug were injuring corn.

CORN BLOTCH LEAF MINER (Agromyza parvicornis Loew)

North Carolina. R. W. Leiby (June 19): Fields of corn have been completely ruined in parts of Hyde, Tyrrell, and Beaufort Counties by the corn blotch leaf miner. Many fields have been plowed up and planted in soybeans. The last serious outbreak in this part of the State was in 1919.



ALFALFAALFALFA WEEVIL (Hypera postica Gyll.)

Colorado. G. M. List (June 22): Alfalfa weevil injury is the most serious ever observed. The population is higher in all of the areas than for several years. In Mesa County, in the area from Palisade to Mack, involving the entire Grand Junction region, the first crop will not be more than from one-third to one-half of normal. Scouting shows some new area involved.

Idaho. C. Wakeland (June 22): I obtained 1,440 larvae of the alfalfa weevil in one hundred sweeps of the net on June 13 in Council, Adams County. For the first time in 10 years, moderate injury is easily noticeable in many of the fields in that locality.

R. W. Haegle (June 19): The infestation in southwestern Idaho is general, with considerable damage to numerous fields, especially in Canyon, Washington, and Adams Counties. This is the first injury of consequence in Canyon County in over 10 years.

Utah. C. J. Sorenson (June 19): The alfalfa weevil is from moderately abundant to very abundant in Sevier County and elsewhere in Utah.

California. A. E. Michalbacher (June 21): The larvae of the alfalfa weevil are rather scarce throughout its entire range in middle California. They are least abundant in the hot, dry San Joaquin Valley. In the cooler areas the highest number collected per one hundred sweeps of an insect net on June 20 ranged from 30 to 40. In both the Pleasanton and the San Francisco Bay areas parasitization by Bathyplectes curculionis Thoms. continues high. Based on examinations of from medium to large alfalfa weevil larvae, the parasitization ranges from 80 to nearly 100 percent.

CLOVERCLOVER LEAF WEEVIL (Hypera punctata Fab.)

Indiana. J. J. Davis (June 25): The clover leaf weevil was reported as destructive to sweetclover at South Whitley on May 29.

Iowa. C. J. Drake (June 24): The clover leaf weevil was found in considerable numbers in alfalfa fields in Montgomery County.

Nebraska. M. H. Swenk (June 14): The clover leaf weevil was reported to be infesting alfalfa fields in Richardson County on May 29.

A SCARABAEID (Phobetus comatus Lec.)

Oregon. D. C. Mote (June): Larvae are doing considerable damage to alfalfa at Hermiston.

VETCHVETCH BRUCHID (Bruchus brachialis Fahraeus)

Pennsylvania. C. C. Hill and E. J. Udine (June 19): Adults and eggs were found on hairy vetch near Waynesboro.

Maryland. C. C. Hill and E. J. Udine (June 19): Adults and eggs were found to be numerous on vetch near Hagerstown.

North Carolina and South Carolina. J. S. Pinckney (June 22): Seed pods of hairy vetch in the vicinity of Salisbury are heavily infested. Larvae within the seed are in all stages of development up to the fourth instar. The hairy vetch bruchid has been found in the following counties: Cabarrus, Catawba, Davidson, Davie, Forsyth, Gaston, Guilford, Iredell, Lincoln, Mecklenburg, Randolph, Rowan, Stanly, Union, and Yadkin, in North Carolina, and in Chesterfield and Lancaster Counties in South Carolina.

## F R U I T I N S E C T S

APPLECODLING MOTH (Carpocapsa pomonella L.)

New York. N. Y. State Coll. Agr. News Letter (June): Owing to unfavorable weather very little damage has been done by the codling moth this month.

Delaware. L. A. Stearns (June 19): Twenty percent mortality of overwintered larvae; emergence of the spring brood completed June 13; first first-brood larvae hatched on May 30; peak of moth activity as indicated by bait pans on May 29; first injury observed in apple orchard on June 6; injury to date much lighter than usual.

Maryland. E. H. Cory (June 22): Codling moth emergence has been retarded by cool weather. There is a strong probability that a large second brood may occur.

Georgia. C. H. Alden (June 20): Codling moth scarce, lowest infestation in a number of years, but beginning to increase.

Ohio. T. H. Parks (June 25): Emergence of moths at Columbus was heavy between May 30 and June 5 and again between June 9 and 15. Bait-pan catches started up again yesterday. The first larval entrances were seen in Lawrence County on June 6, in Miami County on June 12, and at Columbus on June 13. First-brood larvae are much less abundant than last year and many nights during the past 3 weeks have been rainy and unfavorable for egg laying. Moths are still emerging from overwintering cocoons but only a few emerge each day. It is quite apparent that the codling moth will not be the problem it has been during the past 5 years.



Indiana. D. W. Hamilton (June 21): At Orleans, peak flights of spring-brood adults occurred in light and bait traps during the nights of May 13, 21, and 27. Since May 27 daily trap captures have gradually tapered off. Weather conditions have been unfavorable for moth activity all season. First-brood larval entrances and stings are much scarcer than at this time last season.

Illinois. W. P. Flint (June 21): First-brood codling moth emergence was delayed until June 10 to 15. Our check trees in experimental plots in southern Illinois on June 5 showed only 0.3 percent of larval entrances, as compared to 45 percent in the same location on the same date last year.

Michigan. R. Hutson (June 11): The first adult emerged in the field at Lansing on June 6. Pupation throughout the fruit belt is very uneven. Some locations show more than 50 percent pupation on June 5, while others within a few miles show only from 10 to 20 percent.

Minnesota. A. G. Ruggles (June 21): First codling moth adult seen on June 9.

Missouri. L. Haseman (June 26): Emergence of spring-brood moths has been very erratic, beginning on about normal time in the southern half of the State and from 3 to 4 weeks late in the northern half. The fruit is the cleanest we have had for many years.

H. Baker (June 22): At Saint Joseph activity of the moths has been light and larval entrances few, owing partly to continued cool, rainy weather and partly to a greatly reduced population, as compared to that of 1934. The first 1934 entrance was found in the experimental orchard on May 18 and in 1935 on June 12. Bait-trap catches indicate that the peak of spring-brood moth activity occurred from June 8 to 16. The newly hatched larvae appear to be weak, as evidenced by many unsuccessful entrances, even where there is little or no spray coating.

Arkansas. D. Isely (June 22): The infestation of larvae of the first brood is unusually light in northwestern Arkansas. Probably there is less worm injury for this time of the year than in any year since 1928.

Oklahoma. F. A. Fenton (June 24): Codling moths from long-cycle larvae have continued to emerge during June, the date of the last emergence being on June 16. Peaks of emergence came on May 8 and June 2. The emergence curve at Tahlequah followed that at Stillwater, but was 10 days later.

Colorado. G. M. List (June 22): There was a low winter mortality of the larvae. Spring emergence is later than usual but the indications are that the populations are going to be heavy in most of the orchard sections.

Idaho. R. W. Haegle (June 19): Emergence began on May 4, reaching peak on May 20, with a heavy emergence continuing until June 10.

Utah. C. J. Sorenson (June 19): The codling moth is moderately abundant throughout the State.



California. H. J. Ryan (June 24): Inspection of walnut groves in the eastern part of Los Angeles County was begun on May 20. Very few eggs were found until about the 25th, when the egg-laying season reached the peak. Spraying was begun in groves where walnuts had reached nearly full size on May 27. Owing to uneven emergence of adults and the uneven size of the nut, control is likely to be difficult. I understand that spraying was begun in Orange and Riverside Counties about a week earlier than here, indicating that emergence in those sections was earlier.

EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

Maine. H. B. Pairson (June 22): The American tent caterpillar was generally abundant in southern Maine on June 10, nests being very noticeable. In York County they are very numerous.

Massachusetts. E. P. Felt (June 25): Defoliation of cherry trees and neglected orchards is general and almost complete in western Massachusetts.

Connecticut. W. E. Britton (June 24): The caterpillars have now all transformed. One report of large numbers of dead caterpillars suggests bacterial wilt. Stripped trees are now putting out new leaves. Adults are flying.

Delaware. L. A. Stearns (June 19): Infestation slightly less severe than in 1934. Adults now being collected at light traps. (June 20): First egg masses observed at Newark.

New Jersey. T. J. Headlee (June 21): We are just closing the tremendous outbreak of the apple tree tent caterpillar, which occurred practically all over the State and in most extraordinary numbers. The caterpillars this year have shown the presence of much disease and considerable parasitization. In certain parts of the State ground beetles have been very busy in consuming them. We think that the year 1935 was the top year of the cycle and that next year the caterpillars will be materially fewer in numbers.

Pennsylvania. A. B. Champlain (June 17): First adults noted flying on June 15. Some larvae in field have not yet pupated. Defoliation heavy on favorite food plants in mountain regions.

Ohio. J. S. Houser (June): This insect is to be found in many sections of the State this year but is particularly abundant in the northeastern section. The low-growing shrubs of cherry and wild apple in some pasture fields are almost all defoliated. On June 7 the larvae were almost full grown.

GREEN FRUIT WORM (Graptolitha antennata Walk.)

Vermont. H. L. Bailey (June 24): The green maple worm is very abundant on ash and soft maple on the lake shore and swamps in Grand Isle and Chittenden Counties. Defoliation in places.

New York. N. Y. State Coll. Agr. News Letter (June): Green fruit worms were unusually abundant during the early part of the month in the Hudson River Valley and on Long Island. In the western part of the State this insect was about normally abundant.

#### APHIDS (Aphididae)

Connecticut. P. Garman (June 24): Dry period in May probably prevented a serious outbreak of Anuraphis rosae Baker.

New York. N. Y. State Coll. Agr. News Letter (June): Rosy apple aphids were quite numerous in the Hudson River Valley in the early part of the month. By the middle of the month they were leaving the fruit trees. They were also numerous in the western part of the State, doing some damage in orchards where the nicotine was left out of the sprays. Toward the end of the month the green apple aphid (Aphis pomi DeG.) was increasing in number in the Hudson River Valley.

New Jersey. T. J. Headlee (June 21): We have a moderate infestation of rosy apple aphids and a beginning infestation of the green apple aphid.

Georgia. C. H. Alden (June 20): Green aphids are very abundant and injurious in the Esom Hill section.

Michigan. R. Hutson (June 19): Rosy apple aphids are becoming moderately abundant in Berrien, Van Buren, and Allegan Counties. The first migrants were observed on June 14.

Utah. G. T. Knowlton (June 17): Rosy apple aphids are damaging apple foliage on Provo Bench and at Hobbie Creek.

C. J. Sorenson (June 19): Green apple aphids are very abundant in Box Elder County.

#### WHITE APPLE LEAFHOPPER (Typhlocyba pomaria McAtee)

Connecticut. P. Garman (June 24): White apple leafhoppers are abundant in some apple orchards in New Haven and New London Counties.

Virginia. W. J. Schone (June 20): Observations in Roanoke and Frederick Counties indicate that leafhopper adults are very abundant in a few orchards. The white apple leafhopper is most common. Fruit is specked and leaves injured by feeding. Insects more abundant than for several years.

#### APPLE MAGGOT (Rhagoletis pomonella Walsh)

New York. N. Y. State Coll. Agr. News Letter (June): The first apple maggot fly was observed on a Delicious tree in Kingston on June 17.

New Jersey. E. Kostal (June 17): This insect has produced a 100-percent infestation of fruits of some varieties in neglected plantings in Monmouth County. No adult flies could be found on trees on June 16 and 17, the usual date of beginning of emergence.



### APPLE FLEA WEEVIL (Orchestes pallicornis Say)

Indiana. L. F. Steiner (June 16): The apple flea weevil is causing very serious damage in an apple orchard near Buckskin. Adults by the hundreds can be seen by looking up from almost any location under many of the trees. There appears to be a distinct difference in the population density and the amount of foliage injury between cleaned and uncleared parts of the orchard.

### NEW YORK WEEVIL (Ithycerus noveboracensis Forst.)

Michigan. R. Hutson (June 19): The first New York weevil seen in several years was observed at Belding on June 18, where it was fairly plentiful on a planting of young apple trees in recently cleared land.

Wisconsin. E. L. Chambers (May 25): Serious damage resulted to a newly planted orchard of apple and plum trees near Warrens, Monroe County. The light sand area was poorly prepared for planting, there being many oak saplings and sweetfern on the ground that were heavily infested. The beetles destroyed the breaking buds and ate patches of bark on the stems.

### PEACH

### PLUM CURCULIO (Conotrachelus nemophar Hbst.) <sup>1/</sup>

Connecticut. P. Garman (June 24): Damage to apple by the plum curculio is less than usual in New Haven.

New York. N. Y. State Coll. Agr. News Letter (June): The plum curculio was but moderately abundant throughout the State during the month.

Delaware. L. A. Stearns (June 19): Activity of overwintered adults is now ended at Bridgeville; the peak of issuance of first-brood grubs from drop peaches was from June 10 to 15, about 10 days later than usual.

Georgia. O. I. Snapp (June 20): Although no second-generation eggs have been deposited in the insectary at Fort Valley to date, peaches coming to the packing sheds today contain newly hatched larvae, indicating that deposition of second-generation eggs has started in the orchards. A heavy second brood of larvae with considerable damage to the Elberta peach crop has been predicted. (June 21): Deposition of second-generation eggs began in the insectary today, and in the field several days ago. Hiley, the first free-stone variety, is just beginning to ripen; therefore this variety will be subjected to a second brood of larvae, as will Georgia Belle and Elberta. The Hiley usually escapes a second-brood attack, but the emergence of first-generation adults occurred considerably earlier than usual.

---

<sup>1/</sup> The following note credited to O. I. Snapp on page 133 of the May 1, 1935, Insect Pest Survey Bulletin--"May 31. First-generation adults started emerging from peach drops during the night, following rain yesterday"--was sent in by T. L. Bissell, of Experiment, Ga.



C. H. Alden (June 20): The first-brood adults of plum curculio have not yet emerged in Cornelia. A few old beetles are still in the orchards

Ohio. T. H. Parks (June): The plum curculio is very scarce this year.

Michigan. R. Hutson (June 19): Jarring at Hartford and at East Lansing failed to disclose plum curculio on plums until June 8. They usually appear considerably earlier at these places.

Alabama. J. M. Robinson (June 20): The peach curculio is more abundant and earlier than in several years, which indicates a second generation.

#### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (June 24): The first generation is unusually light.

New York. N. Y. State Coll. Agr. News Letter (June): From the middle of June to the end of the month damage to twigs by the oriental fruit moth was observed throughout the State. Damage was not severe.

Delaware. L. A. Stearns (June 19): Forty-two percent mortality of overwintered larvae. Unfavorable weather conditions prevailed during emergence period of spring brood. Emergence completed June 1. Twig injury by first-brood larvae somewhat lighter than usual; brood now practically mature.

Pennsylvania. T. L. Guyton (June 20): The oriental fruit moth is not numerous in Franklin, Adams, and Juniata Counties.

Georgia. O. I. Snapp (June 20): This insect continues less abundant on peach than usual at Fort Valley.

C. H. Alden (June 20): The oriental fruit moth has caused very little twig and no fruit injury at Cornelia to date.

Arkansas. D. Isley (June 22): Injury by the oriental fruit moth has been almost totally absent both in northwestern Arkansas and in the orchards on the southern end of Crowley's Ridge in northeastern Arkansas.

Tennessee. G. M. Bentley (June 16): The oriental fruit moth is 50 percent more abundant than last month in all parts of the State.

Mississippi. C. Lyle (June 22): Inspector G. I. Worthington on June 18 reported general damage to peach twigs by the oriental peach moth throughout Washington, Bolivar, and Sunflower Counties. Inspector N. D. Peets reports considerable damage in Lincoln County, and heavy infestations were reported to this office directly by correspondents in Dorsey and Meridian.

#### PEACH BORER (Aegeria exitiosa Say)

Georgia. O. I. Snapp (June 20): Although hundreds of peach trees in commercial orchards in all directions from Fort Valley have been regularly examined

since April 15, only four pupae have been collected to date, which indicates that there is practically no pupation of this insect under orchard conditions in this locality until July.

Colorado. G. M. List (June 22): Pupae of the peach tree borer were found in the Palisade section on June 13. The injury from this insect to both peach and cherry trees has been heavier than during the past two seasons.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

Delaware. L. A. Stearns (May 22): The black peach aphid is abundant on planting of young peaches at Camden.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Georgia. O. I. Snapp (June 20): This insect continues abundant at Fort Valley, and has caused many misshaped peaches. Nymphs are abundant.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. P. Garman (June 24): The pear psylla is not abnormally abundant on pear in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (June): During the first week in the month eggs for the second brood were being laid in the Hudson River Valley, and about the middle of the month eggs were hatching. In the western part of the State this insect was very numerous. A report from Monroe County indicates that it was more numerous than ever before.

PEAR MIDGE (Contarinia pyrivora Riley)

New York. N. Y. State Coll. Agr. News Letter (June): The pear midge seriously damaged the fruit crop in a number of orchards in both the eastern and western parts of the State.

ROSE LEAF BEETLE (Nodonota puncticollis Say)

New York. N. Y. State Coll. Agr. News Letter (June): Rose leaf beetles were especially abundant in Dutchess County last week. They made up for their delayed appearance by an unusually vigorous campaign on apples and pears. Where fresh applications of arsenic had not been made, injury was serious. They began feeding heavily on pears on June 17 in Ulster County and have ruined the pears in one orchard.

A FLOWER THRIPS (Frankliniella tritici californica Moulton)

California. H. J. Ryan (June 17): Thrips, principally this species, have been causing some damage to pears in the Antelope Valley, and some control treatments have been applied.



CHEERRYCHEERRY FRUIT FLIES (Rhagoletis spp.)

New York. N. Y. State Coll. Agr. News Letter (June ): Cherry fruit flies, R. fausta O. S. and R. cingulata Loew, began to emerge during the first week in June in the Hudson River Valley.

Michigan. R. Hutson (June): The dark-bodied cherry fruit fly (R. fausta) emerged at Gobles on June 7, at Grand Rapids on June 11, at Shelby on the 15th, at Beulah on the 16th, at Northport on the 18th, and at Traverse City on the 26th. The light-banded cherry fruit fly (R. cingulata) appeared at St. Joseph on June 17.

BLACK CHEERRY APHID (Myzus cerasi Fab.)

New Jersey. T. J. Headlee (June 21): We have a considerable infestation of black cherry aphids.

Maryland. E. W. Cory (June 22): Black cherry aphids are feeding on sweet cherry generally throughout the State. They are quite prevalent.

CHEERRY LEAF BEETLE (Galerucella cavicollis Lec.)

Michigan. R. Hutson (June 25): The wild cherry leaf beetle is very prevalent in the vicinity of Topinabee. This is one of the first outbreaks of this insect noted since 1915. The last time this insect was prevalent prior to 1915 was in 1900.

GRAPEGRAPE LEAFHOPPER (Erythroneura comes Say)

New York. N. Y. State Coll. Agr. News Letter (June): Grape leafhopper adults are numerous enough in some vineyards in Dutchess County to produce a troublesome crop of nymphs later on.

Delaware. L. A. Stearns (June 20): The first first-brood nymphs appeared in Camden between June 13 and 20; less abundant than usual. First activity of overwintered adults observed in vineyards on May 21. The infestation will probably be much lighter than usual.

Michigan. R. Hutson (June 19): Adults of grape leafhopper are very abundant on grapes about Decatur, where as many as 25 or 30 are commonly found on the under sides of young grape leaves.

Arizona. C. D. Lebert (June 24): The grape leafhopper observed on grapevines. Some foliage injury.



Utah. G. F. Knowlton (June 17): Grape leafhoppers were damaging grapes at Hurricane and North Farmington. Nymphs are becoming adult in southern Utah.

California. H. J. Ryan (June 17): The grape leafhopper has started to show up on some grape plantings in Los Angeles County and it is possible that a little control work will be done. It is too early to tell whether the infestations will be as heavy as last year.

#### GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Delaware. L. A. Stearns (June 1): First emergence of spring-brood moths on May 30; no first-brood injury observed.

#### CURRENT

##### CURRENT APHID (Myzus ribis L.)

Wisconsin. E. L. Chambers (June 20): Currant and gooseberry bushes throughout the State infested with aphids this summer.

##### FOUR-LINED PLANT BUG (Poecilocapsus lineatus Fab.)

New York. N. Y. State Coll. Agr. News Letter (June): Four-lined plant bugs are serious in a few currant patches in Ulster and Dutchess Counties.

##### SAY'S STINK BUG (Chlorochroa sayi Stahl)

Utah. G. F. Knowlton (June 17): Say's plant bugs were present in injurious abundance on black currants at Virgin.

##### CURRENT STEM GIRDLER (Janus integer Nort.)

New York. N. Y. State Coll. Agr. News Letter (June 17): Currant stem girdlers are serious in a few currant patches in Dutchess County.

Maryland. E. N. Cory (June 12): The willow shoot sawfly (J. integer) is attacking pussy willow at Laurel.

#### PECAN

##### FALL WEBWORM (Hyphantria cunea Drury)

New York. N. Y. State Coll. Agr. News Letter (June 17): The fall webworm was hatching on June 10 and was making tents on June 12 in Orange County.

Delaware. L. A. Stearns (June 20): First appearance of fall webworm in Newark.

Maryland. E. N. Cory (June 22): The fall webworm is attacking a variety of shade and ornamental trees at College Park.

Tennessee. G. M. Bentley (June 15): The fall webworm is in evidence earlier this year than for several years. Usually this insect becomes numerous late in the summer or early in the fall, but many outbreaks have already been reported this year.

Alabama. J. M. Robinson (June 20): The first-generation larvae of the webworm have been active at Auburn and in central Alabama on pecan foliage for 2 weeks.

Mississippi. C. Lyle (June 22): The fall webworm is generally distributed over the State, attacking pecans and persimmons especially.

#### WALNUT CATERPILLAR (Datana integerrima G. & R.)

Mississippi. H. Gladney (June 22): The first colony of walnut caterpillars observed this year was on May 27 at Ocean Springs. On June 19 I observed considerable damage to pecans in Jackson and Harrison Counties. The caterpillars are more numerous than last year.

#### AIN UNDERWING (Catocala viduata Guen.)

Mississippi. C. Lyle (June 22): Worms were attacking pecans at Clarksdale on June 21.

#### BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Mississippi. H. Gladney (June 22): The black pecan aphid has appeared in Jackson and Harrison Counties.

#### PHYLLOXERA (Phylloxera spp.)

Mississippi. C. Lyle (June 22): Damage by P. devastatrix Perg. on pecans was reported by Inspector Jack Milton at Vicksburg on June 5. A severe infestation of P. notabilis Perg. on pecans at Cleveland was reported on June 5.

#### CITRUS

##### ORANGE TORTRIX (Tortrix citrana Fern.)

California. H. J. Ryan (June 24): The orange tortrix was taken feeding on a loquat tree (Eriobotrya japonica) growing on a residential property in Los Angeles. A considerable portion of the fruit was damaged.

##### GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. J. R. Watson (June 20): Small colonies of the citrus aphid were in evidence on young growth from Alachua County southward.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

California. H. J. Ryan (June 17): Red scale infestations increased rapidly in Los Angeles County during the warm winter, but in early spring there was a noticeable decrease in emergence and present indications are that infestations generally will be little, if any, worse than last year, although considerably heavier than normal.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Arizona. C. D. Lebert (June 24): Several new infestations of the cottony cushion scale have been discovered in and around Phoenix on ornamentals and ornamental citrus. Vedalia beetles (Rodolia cardinalis Muls.) are placed in each locality for control.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (June 20): Up until the last few days the weather has been dry over most of the citrus belt, with the result that heavy infestations of rust mites were built up on citrus.



## TRUCK - CROP INSECTS

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

- Indiana. J. J. Davis (June 25): The corn seed maggot was destructive to corn in Tippecanoe, Tipton, and La Porte Counties the first few days in June. These infestations were found in early planted corn that did not germinate promptly because of the cool, wet weather.
- Michigan. R. Hutson (June 19): Some of the heaviest infestations of seed corn maggot ever seen have been reported from Charlotte on peas and beans.
- Wisconsin. E. L. Chambers (June 20): Seed corn maggots are unusually severe throughout the State, requiring replanting of beans and corn in a great many places.
- Minnesota. A. G. Ruggles (June 21): The seed corn maggot is moderately abundant. A few reports of injury where corn germinated slowly were received.
- North Dakota. J. A. Munro (June 23): The corn seed maggot caused heavy damage to several fields of wheat and corn in the vicinity of Selfridge, Sioux County, on June 10. On June 21 it was causing moderate injury to a field of corn in Burleigh County, in the vicinity of Wilton, McLean County.
- Nebraska. M. H. Swenk (June 14): The seed corn maggot was repeatedly reported as destroying planted seed corn from Antelope, Boone, and Sherman Counties during the last week in May.
- Idaho. C. Wakeland (June 22): Stands of peas in the Donnelly area, Valley County, have been thinned materially and a few fields plowed up because of the attack of the seed corn maggot. This is the first record we have of this insect attacking peas. The seed corn maggot has also caused injury to bean stands in Jerome and Twin Falls Counties.
- Utah. G. F. Knowlton (June 17): Seed corn maggots have injured germinating beans and corn in Utah County.

A TORTRICID (Ablabia longana Haw.)

- Oregon. W. D. Edwards (June): Emerged at Corvallis on June 17; oviposition, June 20. Attacking hops and flax in Willamette Valley.

STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

- Virginia. H. G. Walker (June 25): Striped cucumber beetles have been very abundant in some fields of cucumbers and cantaloups in Norfolk, but very scarce in other fields.
- Ohio. B. J. Landis (June 24): Striped cucumber beetles appeared in numbers on squash and citron at Columbus from June 1 to 3.

Wisconsin. E. L. Chambers (June 20): The striped cucumber beetle has been more abundant this summer than for several years and is doing serious damage to cucurbits everywhere, except where control measures are being persistently carried on.

Alabama. J. M. Robinson (June 20): The striped cucumber beetle is active on squash and pickles at Auburn.

Mississippi. C. Lyle (June 22): Striped cucumber beetles are reported as generally abundant over the State, injuring melons especially.

Oklahoma. F. A. Fenton (June 24): The striped cucumber beetle is causing severe damage to cucumbers and squash.

#### BLISTER BEETLES (Meloidae)

South Carolina. W. C. Nettles (June 21): Striped blister beetle reported attacking soybeans and dahlias.

Alabama. J. M. Robinson (June 20): Epicauta pennsylvanica DeG. and Macrobasis unicolor Kby. were destroying 3 acres of Irish potatoes in Fayette County. E. cinerea marginata Fab. was destroying beans at Leroy.

Mississippi. C. Lyle and assistants (June 22): Numerous complaints of blister beetles have been received during the month. E. Lemniscata Fab. was reported from Ethel on June 7 and from Belden on June 17. M. unicolor was reported from Mashulaville, Edinburg, Weir, and Noxapater. Irish potatoes were suffering most severely, with tomatoes being attacked at one place. Blister beetles are attacking soybeans and garden crops on several properties in the vicinity of Grenada.

Kansas. H. R. Bryson (June 27): Blister beetles were reported to be causing injury to potatoes at Ada on June 16.

#### MARGINED SOLDIER BEETLE (Chauliognathus marginatus Fab.)

Ohio. J. S. Houser (June 10): A correspondent at Germantown reports that the margined soldier beetles first ate the center of young corn seedlings and later fed on the leaves. Serious damage was done to lima beans. Alfalfa and weeds were also attacked.

#### FALSE CHINCH BUG (Nysius ericae Schill.)

Iowa. H. E. Jaques (June 17): False chinch bugs were abundant in northern counties last week.

Utah. G. F. Knowlton (June 20): False chinch bugs are damaging turnips, beets, and radishes in one garden at Enterprise.



SOUTHERN GREEN STINK BUG (Nezara viridula L.)

Florida. J. R. Watson (June 20): The southern green stink bug has been more common than usual at this season of the year. However, it was about 50 percent parasitized by Trichopoda pennipes Fab., which is a higher parasitization than usual.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

Virginia. H. G. Walker (June 24): Garden flea hoppers have been from moderately to very abundant on cantaloups, beets, carrots, beans, and lettuce in fields near Norfolk.

MEADOW FROGHOPPER (Philaenus leucophthalmus L.)

New Jersey. T. J. Headlee (June 21): We have had a most extraordinary outbreak of spittle insects occurring on legumes, particularly sweetclover and alfalfa, and also on weeds. We have had some outbreaks on strawberries and less on raspberries and blackberries. The species concerned in this outbreak is P. leucophthalmus and about five of its varieties.

Delaware. L. A. Stearns (June 11): P. leucophthalmus is unusually prevalent on alfalfa, clover, and whitetop. Nymphs in spittle masses were three-fourths mature on May 29. First adults appeared on June 11. Infestation were heavy throughout northern New Castle County, but light in Kent and Sussex Counties. Several color varieties are represented.

## SPRINGTAILS (Collembola)

Utah. G. F. Knowlton (May): The springtail Achorutes matus Folsom was abundant on strawberry plants at Provo on May 23. Onychiurus sp. was reported on May 30 as destroying germinating beans at Alton. (Det. by J. W. Folsom.)

Indiana. J. J. Davis (June 25): Springtails were reported as destructive to 15 acres of alfalfa seedlings at Muncie on May 27.

GARDEN CENTIPEDE (Scutigera immaculata Newp.)

California. A. E. Michelbacher (June 21): The garden centipede has apparently been more destructive this year than heretofore. Many field crops, as well as greenhouse plantings, have been injured considerably. During the past week at Alvarado, I examined a portion of a potato planting that was being severely damaged. This is the first time I have ever observed potatoes being injured by this pest.

POTATO AND TOMATOCOLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

New Jersey. C. H. Hadley (June 5): First adults of the Colorado potato beetle observed today, attacking tomato at Moorestown.



Delaware. L. A. Stearns (June): First adults observed on small potato plants at Newark on May 30. Infestation general by June 15.

Florida. J. R. Watson (June 20): The Colorado potato beetle attacked plantings of eggplants in Gainesville in large numbers.

Ohio. J. S. Houser (June 19): The damage by the Colorado potato beetle to tomatoes in the Marietta truck growing district has been considerable this year. Not only is the foliage eaten, but some of the young tomatoes are nipped and the value of the fruit is thus destroyed. Some growers have have been obliged to spray or dust.

B. J. Landis (June 24): Colorado potato beetles were numerous at Columbus June 10. First pupae were observed on June 17.

Alabama. J. M. Robinson (June 20): The Colorado potato beetle is abundant on late potatoes, tomatoes, eggplant, and other solanaceous plants, cultivated and wild, throughout the State.

North Dakota. J. A. Munro (June 18): Colorado potato beetle moderately abundant at Fargo.

Iowa. C. J. Drake (June 24): The Colorado potato beetle has been doing considerable damage to tomato plants in large plantings in the vicinity of Muscatine and Cedar Rapids. It is also found on potatoes, but not in such large numbers as on tomato.

#### CORN EAR WORM (Heliothis obsoleta Fab.)

Ohio. J. S. Houser (June): First adult of the season observed at Marietta on June 12. This insect was flushed from a tomato plant. Although a careful watch has been maintained, no eggs have been seen. Adults have not been attracted to baits or to a trap light, although both methods are operated continuously.

South Carolina. F. Sherman (June 21): The corn ear worm is more abundant in tomato fruits at this early season than in most years. No nearby corn is yet in silk, which I believe to be a factor.

Mississippi. C. Lyle (June 22): The corn ear worm has caused more than usual damage to tomatoes at this time of the year. Inspector G. L. Bond reports that it was so abundant in a field of corn near Pascagoula that all the top leaves were cut back half their length.

Kansas. W. T. Emery (June 17): The first eggs on silks of sweet corn in the Kansas State Agricultural College experimental plots at Manhattan were observed today.

Oklahoma. F. A. Fenton (June 24): The corn ear worm is causing light injury to beans, tomatoes, and corn. The population is very small. Two adult males have been recently collected in the trap light.

California. J. C. Elmore (June 19): Tomato growers in Orange County say that the tomato fruit worm is unseasonably abundant this year. One parasite has been observed.

### THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

Mississippi. C. Lyle (June 22): The three-cornered alfalfa hopper was girdling tomato plants at Starkville on June 5. The damage was very similar to that done on alfalfa.

### POTATO APHID (Illinoia solanifolia Ashm.)

Virginia. H. G. Walker (June 25): The pink and green aphid is becoming rather abundant in some fields of potatoes, eggplant, and tomatoes at Norfolk.

Ohio. B. J. Landis (June 14): The pink and green aphid on tomato is extremely numerous at Columbus.

### BEANS

#### MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

Connecticut. N. Turner (June 24): This beetle emerged from hibernation about two weeks later than usual.

New Jersey. E. Kostal (June 17): The Mexican bean beetle was first noted on garden beans on June 8 in Monmouth County. This is 2 weeks later than the average date for the past 4 years.

Delaware. L. A. Stearns (June 5): Overwintered adults observed in several localities on this date; infestation about normal on June 19.

Maryland. J. A. Hyslop (July 1): Larvae extremely numerous at Silver Spring. No pupae observed.

Virginia. W. J. Schoene (June 20): The Mexican bean beetle has been reported in larger numbers than usual from different sections of the State.

H. G. Walker (June 25): The Mexican bean beetle is moderately abundant at Norfolk. About 35 percent survived the winter and emerged from our hibernation cage.

F. F. Smith (June 3): Although beans were present in gardens in the residential section of Clarendon during the latter part of April, the first adult beetle was not noted until May 4.

Ohio. E. W. Mendenhall (June 12): The Mexican bean beetle has put in its appearance in Springfield and some patches of beans are very badly damaged.



B. J. Landis (June 24): On June 10 adults of the Mexican bean beetle were feeding extensively on young soybeans at Columbus.

H. C. Mason (June 24): Fourth-instar bean beetle larvae are quite numerous at South Point and a few scattered pupae are appearing. Heavy rainfall and cool weather at South Point has retarded the development of the beetle.

Indiana. J. J. Davis (June 25): The Mexican bean beetle has been prevalent throughout the southern part of the State and reports are now being received from many localities in the northern half.

South Carolina. W. C. Nettles (June 21): The Mexican bean beetle is complained of as worse than heretofore near the coast.

C. O. Bare (June 15): Typical Mexican bean beetle injury to bean foliage on 10 plants in a back-yard garden in Charleston County was found and 7 larvae were present at the time of examination.

Alabama. J. M. Robinson (June 20): The Mexican bean beetle is generally very abundant over the central and northern parts of the State.

Mississippi. C. Lyle (June 22): Many complaints of the Mexican bean beetle have been received throughout the month. Undoubtedly weather conditions have been rather favorable for it. Two new counties in the southern part of the State, Covington and Jones, are infested for the first time.

#### BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. F. F. Smith (June 3): Bean leaf beetle adults are numerous and causing extensive injury to a planting of lima beans near Falls Church.

Alabama. J. M. Robinson (June 20): Bean leaf beetles are active at Leroy on beans.

Mississippi. C. Lyle (June 22): Injury to the roots of beans by larvae was reported from Lexington on June 4, and to bean foliage by adults from Hattiesburg on June 20.

#### LIMA BEAN VINE BORER (Monoptilota pergratialis Hulst)

Mississippi. M. L. Grimes (June 22): Injury to beans by the lima bean vine borer was observed at Meridian on June 4.

#### PEAS

#### PEA APHID (Illinoia pisi Kalt.)

Connecticut. N. Turner (June 24): Pea aphids are reported as very abundant in two large fields at New Haven.



New York. N. Y. State Coll. Agr. News Letter (June): Pea aphids are showing up on peas to some extent in Niagara County. One cannery imported ladybeetles and liberated them in pea fields in an endeavor to control the aphids. Some canners are dusting.

Ohio. T. H. Parks (June 26): A telephone call today reports that the pea aphid is badly injuring peas grown for a canning factory at Wauseon.

Indiana. J. J. Davis (June 25): The cool spring has been unusually favorable to aphids, which are exceedingly abundant on garden crops, especially peas.

Michigan. R. Hutson (June 11): The pea aphid is fairly abundant on alfalfa at Lakeview, Vestaburg, Frankfort, and Fremont. Also observed on peas at Ithaca on May 20, but only a few winged migrants were present.

Wisconsin. E. L. Chambers (June 20): Reports received from all over the State wherever peas are grown extensively for canning, indicate serious infestations in spots and an abundance of them on alfalfa.

J. E. Dudley, Jr., (June 18): A heavy infestation of aphids in alfalfa in southern Wisconsin followed a generally cool, wet spring, which is not supposed to be favorable for rapid multiplication of the insect. Heavy and general flights occurred late in May to peas. Infestation built up rapidly but was reduced by rainstorms and cool weather early in June; again built up rapidly following several warm, humid days, until many fields of peas less than a foot high were threatened with serious injury. The prolonged recent rains have again reduced the infestation considerably.

North Dakota. J. A. Munro (June 18): The aphid is abundant on sweet peas in Fargo and vicinity.

Kansas. E. T. Jones (June 29): In view of the favorable conditions for aphid development, sweepings made from June 14 to 24 in alfalfa fields in nine counties in eastern Kansas have shown a remarkable scarcity of aphids. In general the aphid population, which was increasing in April, has dropped back to a low point. Predatory insects which were very abundant two months ago are now conspicuously absent. Presumably the large numbers of ladybeetles and nabids (Nabis fesus L.) present in April have been reduced to practically none through starvation.

Mississippi. C. Lyle (June 22): Considerable damage to peas by the pea aphid was reported from Hamilton on June 19.

Idaho. C. Wakeland (June 22): Pea aphids are almost entirely absent from the pea fields of northern Idaho this year. Parasitization was very heavy last summer, so that the hold-over population of the aphid was light. Ladybeetles hibernated successfully in enormous numbers and migrated to pea fields early, so there is little possibility of pea aphid populations increasing sufficiently to cause any damage.

Utah. G. F. Knowlton (June 22): Pea sphids are causing some injury to field peas in Box Elder County.

### CABBAGE

#### CABBAGE MAGGOT (Hylemyia brassicae Bouché)

New York. N. Y. State Coll. Agr. News Letter (June): The cabbage maggot has occasioned severe damage in Niagara, Wayne, and Ontario Counties.

North Carolina. C. H. Brannon (June 20): The cabbage maggot is causing tremendous damage in the mountain cabbage sections, and is especially destructive to commercial plantings of cabbage in Avery, Macon, and Jackson Counties.

Wisconsin. E. L. Chambers (June 20): Cabbage maggots have seriously injured cabbage and radishes, and some truck growers complain they have lost their crops despite repeated treatments.

#### CABBAGE APHID (Brevicoryne brassicae L.)

Indiana. J. J. Davis (June 25): Cabbage aphid has been abundant during the month on cabbage at Crawfordsville, Marengo, and elsewhere in the State.

North Dakota. J. A. Munro (June 18): The cabbage aphid is abundant in Fargo and vicinity.

#### HARLEQUIN BUG (Murgantia histrionica Hahn) 2/

Virginia. H. G. Walker (June 25): The harlequin bug, although present, has been very scarce this spring at Norfolk.

#### DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker (June 25): Larvae of the diamond-back moth are beginning to appear in moderate numbers in some fields of cabbage at Norfolk.

Ohio. B. J. Landis (June 24): First diamond-back moth observed in field June 5 at Columbus.

Colorado. G. M. List (June 22): The larvae of the diamond-back moth are very numerous in the western part of Colorado. In the Grand Junction area they have developed in large numbers on whitetop, or perennial peppergrass, a noxious weed in that region. Cabbage is being rather severely injured in some localities.

---

2/ In the note on M. histrionica by B. J. Landis and H. C. Mason, on page 143 of the last number of the Insect Pest Survey Bulletin, the place of observation was South Point, Ohio, not Columbus.



Utah. G. F. Knowlton (June 7): Diamond-back moths are heavily attacking mustards in various parts of northern Utah. At North Ogden they are heavily attacking whitetop.

#### CABBAGE LOOPER (Autographa brassicae Riley)

Virginia. H. G. Walker (June 25): Larvae of the cabbage looper are beginning to appear in moderate numbers in some fields of late cabbage.

#### MELONS

##### PICKLE WORMS (Diaphania spp.)

Florida. J. R. Watson (June 20): D. hyalinata L., and D. nitidalis Stoll, are becoming very numerous, as usual, this time of the year. At least 75 percent of the squashes, cucumbers, and cantaloups are infested.

Mississippi. C. Lyle (June 22): The pickle worm, according to inspector N. L. Douglass, has been reported from several localities in Yalobusha and Grenada Counties. A specimen was received from Shuqualak, Noxubee County, on May 28 and adults were collected at lights at State College, Oktibbeha County, on June 14.

##### HORNED SQUASH BUG (Anasa armigera Say)

Mississippi. C. Lyle (June 14): Severe damage to melon vines was reported from Meridian on June 14.

#### CARROT

##### CARROT BEETLE (Ligyris gibbosus DeG.)

Illinois. W. P. Flint (June 21): A very heavy flight of adults of the carrot beetle observed in the southern third of the State. This beetle is very abundant on ragweed and is causing severe damage to young corn on bottom land.

Michigan. R. Hutson (June 19): The carrot beetle was reported at Manchester on June 17 as injuring carrots. This beetle had been very common for the past 2 years on everything but carrots.

Minnesota. A. A. Granovsky (June 21): The carrot beetle is very common in several sections of the State. The beetles are injuring carrots and other truck crops. One large planting of perennial coreopsis near Minneapolis was completely ruined by the adults feeding on the roots.

Missouri. L. Haseman (June 26): The carrot beetle has been more abundant this year than I have ever seen it in Missouri. It is even attracting attention on the golf greens in Columbia.

Kansas. H. R. Bryson (June 27): The carrot beetle is reported to be abundant, causing injury in a garden at Coolidge. A correspondent states that the same garden had been injured in previous years.



SWEETPOTATOSWEETPOTATO LEAF BEETLE (Typophorus viridicyaneus Crotch)

North Carolina. C. H. Brannon (June 13): The sweetpotato leaf beetle is very abundant on sweetpotatoes in Currituck County.

A TORTOISE BEETLE (Metriona bivittata Say)

Delaware. L. A. Stearns (June 20): Adults abundant on sweetpotato at Laurel, where they are feeding considerably. Eggs have been deposited but none have hatched.

SWEETPOTATO FLEA BEETLE (Chaetocnema confinis Crotch)

Virginia. H. G. Walker (June 25): The sweetpotato flea beetle was reported as being very abundant in some sweetpotato fields at Norfolk early in June.

A WEEVIL (Calomycterus setarius Roelofs)

Pennsylvania. T. L. Guyton and A. B. Champlain (June 17): Specimens were brought to the Department office by a resident of Mechanicsburg, who complained that they were damaging his sweetpotato plants. As the species was not represented in our collection we visited the truck patch for more material. We also examined the general locality. We found the beetle abundant on yarrow, generally scattered on the flower, and quite plentiful on the new sweetpotato plants. This is the first record of this insect from Pennsylvania. (Det. by L. L. Buchanan.)

ONIONONION MAGGOT (Hylemyia antiqua Meig.)

New York. M. C. Richards (June 17): Onion maggots are causing serious losses to many growers in Nassau County.

Wisconsin. E. L. Chambers (June 20): Reports of injury to onions have been more common this spring than for several years. Some report complete crop failure in smaller patches.

Utah. G. F. Knowlton (June 26): Onion maggots have killed 95 percent of the onions in one garden patch at Logan. Reports of injury to onions in several parts of Utah County have also been received.

STRAWBERRYSTRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Indiana. J. J. Davis (June 25): The strawberry leaf roller has been reported from all parts of the State, and apparently is more abundant than normally.



severe curly top where beet leafhoppers are becoming increasingly abundant.

### TOBACCO

#### TOMATO WORM (Phlegethontius sexta Johan.)

Georgia and Florida. F. S. Chamberlin (June 19): Tomato worm infestations in the shade-grown tobacco district of northern Florida and the flue-cured tobacco section of southern Georgia are considered about normal.

#### POTATO TUBER WORM (Gnorimoschema operculella Zell.)

Georgia. F. S. Chamberlin (June 20): Only one infestation of commercial importance observed this season in tobacco. This one infestation of splitworm is located at Norman Park.

#### TOBACCO BUDWORM (Heliothis virescens Fab.)

Georgia and Florida. F. S. Chamberlin (June 20): Tobacco budworms appear to be more abundant than usual in the northern Florida tobacco district but about normal in southern Georgia.

#### POTATO STALK BORER (Trichobaris trinotata Say)

North Carolina. C. H. Brannon (June 26): The potato stalk borer has appeared in destructive numbers on tobacco in Onslow County. The infestation is spotted and is confined largely to one field. This species was reported from Onslow County in 1932 as the first recorded instance of attack on tobacco.

### C O T T O N I N S E C T S

#### BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. W. C. Nettles (June 21): Coincident with earlier fruiting than usual, reports indicate more boll weevil damage than usual this early in the season.

Clemson Agr. Coll. Ext. Serv. News Letter (June 3): Weevils are reported as abundant in many of the coastal counties. County agents report large variations in the number of adult weevils found per acre, stating that often several fields would be visited before weevils were found; in other fields as many as 3,000 weevils per acre might be found.

F. F. Bondy and C. F. Rainwater (June 22): Emergence from hibernation is probably about complete. A few fields are fairly well infested, but the heat and dry weather are killing many of the weevil larvae in the squares on the ground. Some weevil pupae have been observed and the first generation will soon be out.



Georgia. T. L. Bissell (June 19): The boll weevil is injurious at Experiment. Punctured squares containing half-grown larvae are falling from early cotton.

C. H. Alden (June 20): Boll weevils are scarce at Cornelia.

Alabama. J. M. Robinson (June 20): The cotton boll weevil is moderately abundant in central and southern Alabama. Weevils have been reported as earlier and more numerous than usual in the Tennessee Valley near Huntsville.

Mississippi. C. Lyle (June 22): The boll weevil is already appearing in large numbers in many cotton fields. Examinations made by State Plant Board inspectors in 124 fields in 37 counties during the week ended June 15 showed weevils present on 84 farms, with an average of 192 weevils per acre on 65 farms, and an infestation of  $9\frac{1}{2}$  percent on 19 farms where squares were large enough to be counted. Weevils are already present in Tippah and Tishomingo Counties on the Tennessee border, which is usually the last part of the State to become infested each season.

E. W. Dunnam (June 22): Boll weevils are appearing in great numbers in early cotton, especially near wooded areas, in Washington County and adjoining counties in the Delta. Practically no weevils can be found in large open fields of late cotton.

H. C. Young (June 29): The infestation in 10 Oktibbeha County fields averaged 22.1 percent, as compared to 8.7 percent in similar fields a year ago.

M. C. Ewing (June 29): In twelve fields in Forrest County the average infestation was 10.2 percent, as compared to 17.5 percent for the week ending June 30, 1934.

Louisiana. W. E. Hinds (June 7): H. B. Brown, who has charge of cotton production at the Baton Rouge station, reports that he and his assistants have recently gathered up to 100 or more weevils per acre from some of their early planted plats of cotton. This indicates a rather heavy weevil survival.

R. C. Gaines (June 22): Some first-generation weevils emerged during the past week. (June 29): The average square infestation in 34 untreated plots was 9.5 percent. The infestation was sufficiently high to make poisoning necessary for approximately one-third of the plots that will be treated. Indications are that a large proportion of the acreage in this territory will be poisoned this season. Considerable commercial poisoning with airplanes and ground machines has already been done.

Oklahoma. C. F. Stiles (June 21): Cotton is very late in the boll weevil section of Oklahoma, which comprises the eastern two-thirds of the State. Up to and including June 19, a total of 25 weevils had emerged from hibernation cages, out of a total of 25,000 installed in the fall of

1934. This is compared to 198 out of 28,000 installed in the fall of 1933, and 22 out of 35,000 installed in the fall of 1932. Weevils are just now beginning to make their appearance in the fields. In one field at Eufaula, we failed to find any weevils on June 6. On June 10 they were found at the rate of 10 per acre, and on the 12th at the rate of 75 per acre. In Okmulgee County they average 80 per acre. In Atoka County only one field examination was made and weevils averaged 286 per acre. In McCurtain County they varied from 20 to 330 per acre.

Texas. H. J. Reinhard (June 22): Weather has continued to be very favorable for boll weevil multiplication throughout central and southern Texas. In some fields situated near woods or other favorable hibernation quarters 50 percent of the squares have been punctured.

K. P. Ewing and R. L. McGarr (June 22): Infestation records made in two fields in Calhoun County show an average of 46.4 percent of the squares punctured by the boll weevil. These fields probably represent the maximum infestation in the county, as they are located close to woods in a creek bottom. However, weevils and punctured squares are very noticeable in many fields in the open prairie.

#### BEET ARMYWORM (Laphygma exigua Hbn.)

Texas. H. J. Reinhard (June 22): On June 3 the beet armyworm was reported as seriously damaging alfalfa and cotton in Reeves County. Sweetclover and several other crops were also attacked.

New Mexico. J. S. Brock (June 3): The beet armyworm is doing considerable damage to young cotton, Indian corn, alfalfa, and garden and truck crops in the irrigated valleys of New Mexico. The first appearance of the armyworm was reported in the Mesilla Valley about May 20. Part of the young cotton crop is being replanted and various poisons are being used in an effort to control the pest.

Arizona. T. C. Barber (May 29): On May 27 a survey was made in the neighborhood of Safford and it was found that a little green worm (probably the beet armyworm), which has recently been very active in the various cotton districts, had inflicted damage generally to the seedling cotton. In most cases this injury had not materially reduced the stand, but the cotton had been frequently set back at least a week or 10 days in recovering from the injury. The invasion of the worms was apparently almost ended, as considerable searching was necessary to find a few specimens for our collection. This contrasted with conditions of the preceding week, when several of the worms in all sizes could be found in every group of seedlings. In only one case was absolute destruction of the cotton stand reported, one man stating that he was going to have to replant 40 acres. In several cases the stand appeared to be materially injured, but in many cases the terminal buds of the seedlings were uninjured, and in the course of time would produce fresh foliage.



## CUTWORMS (Noctuidae)

Arizona. T. C. Barber (May 29): The most drastically injured cotton observed on a survey around Safford was a field where cutworms were working. It was located about 3 miles west of Safford and consisted of 50 acres of cotton seedlings, of which the western half of the field was destroyed 100 percent, while the eastern half of the field had a good stand. The outbreak had evidently started along the entire western edge of the field and the worms had steadily advanced along the cotton rows to the center, destroying every cotton plant as they advanced. The line of demarcation at the point of farthest advance was plainly visible from the road, about 150 yards distant. Specimens of the cutworms were collected out of the soil along the edge of the line of injury, and considerable fresh damage was visible, indicating that the worm advance was still in progress. All cutworms collected were evidently nearly fully grown, however, and apparently they were about ready to pupate. This indicated that the damage would soon decrease.

Egypt. A. H. Rosenfeld (June 8): The principal entomological feature here for May was the appearance of rather large numbers of eggs of Prodenia sp. in the northern Delta, during the record-breakingly sustained hot spell of the last week, with smaller numbers, as usual, in the more southerly Delta. In Upper Egypt, also, there were sporadic cases of oviposition, but damage is seldom serious south of Cairo. Under the supervision of Government inspectors and with the cooperation of the planters, hand picking has been apparently effectively carried out and few worms are at present in evidence.

PINK BOLL WORM (Pectinophora gossypiella Saund.)

Texas. R. E. McDonald (May 27): Both of the trap plots at Castolon are now blooming. The first part of the week a pink boll worm was found in a bloom from the Cartledge plot. The plots at Presidio have not yet begun blooming; however, L. B. Coffin found a few blooms, none of which were infested, in stub cotton on two farms.

BOLL WORM (Heliothis obsoleta Fab.)

Louisiana. W. E. Hinds (June 7): This morning I received complaints from a cotton grower located about 14 or 15 miles from Baton Rouge regarding a heavy outbreak of cotton boll worm in his young cotton. Most of these worms are from one-half to two-thirds grown, with very few full-grown worms present. Bolls are beginning to reach the half-grown stage. This outbreak occurs in an area poisoned several times earlier for boll weevil control and where weevil control has been satisfactory.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. H. J. Reinhard (June 22): Since May 23 the cotton leaf worm has continued to increase and spread in the southern counties of the State. By June 15, cotton plants were being ragged. Poisoning operations are under way in the vicinity of Corpus Christi, Gregory, Taft, and Robstown. The present northernmost report of occurrence for the insect in Texas is Williamson County.



## APHIDS (Aphidae)

General. F. F. Bondy and C. F. Rainwater (May): In a limited survey made in May, five species of aphids were found on cotton along the Atlantic seaboard. The green cotton root louse (Anuraphis maidi-radicis Forbes) was the most widely distributed, having been found in every section of South Carolina, except the extreme west and northwest, and in the eastern part of Georgia, North Carolina, and southeastern Virginia. In fact, it was found causing injury to cotton in every section scouted except northern Florida. The white cotton root louse (Trifidaphis phaseoli Pass.) was observed in many parts of South Carolina, in eastern North Carolina, and in southeastern Virginia. It becomes more numerous along the seaboard in the northern part of the Cotton Belt and reduces the stand in areas where found. The brown cotton root louse (Rhopalosiphum sp.) was found in certain areas of Virginia, North Carolina, and South Carolina. In every instance but one it was associated with one or both of the other root aphids. In the one field where this species was found alone the injury was comparable to that caused by a heavy infestation of either of the other species. The aerial forms found attacking cotton were Aphis medicaginis Koch. and A. gossypii Glov. A. medicaginis was by far the more serious and was more generally distributed in Georgia, South Carolina, and North Carolina. Its attack is almost always confined to the terminal buds and it is seldom seen on the large leaves, except in cases of extremely heavy infestation. A. gossypii was found only in scattered areas of the States visited, usually on the larger leaves of the cotton.

Mississippi. C. Lyle (June 22): Plant lice are rather abundant on cotton throughout the State, but ladybird beetles are unusually numerous and are expected to easily hold the lice in check.

Alabama. J. M. Robinson (June 20): The cotton aphids have been moderately abundant in Auburn, but are being controlled by parasites and predators. In the Tennessee Valley near Huntsville and in north-central Alabama these insects have been very numerous. As a result of the parasites and predators, particularly convergent ladybeetles (Hippodamia convergens Guer.) the aphids are being controlled.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. H. J. Reinhard (June 22): Injury to cotton by the cotton flea hopper seems to be quite general in McLennan, Bell, and Burleson Counties.

A CRICKET (Anurogryllus muticus DeG.)

Mississippi. M. L. Grimes (June 22): Injury to cotton by A. muticus was observed on June 5 at Heidelberg.

## FOREST AND SHADE-TREE INSECTS

OBLONG LEAF WEEVIL (Phyllobius oblongus L.)

Ohio. M. W. Blackman (July 1): A defoliator of various trees in Europe, and especially injurious to fruit trees, was first found in this country near Rochester, N. Y., 1923. Last year this beetle was found by J. S. Houser near Painesville, Ohio, and is quite numerous there this year. An examination early in June showed its occurrence over an area some 20 miles long by 10 or 15 miles wide. In places it was very abundant, causing noticeable but not injurious defoliation on several species of maple and elm.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Maine. H. B. Peirson (June 22): Severe outbreaks of the forest tent caterpillar are occurring in the southern half of Maine.

Vermont. H. L. Bailey (June 24): The forest tent caterpillar is extremely abundant in spots. Complete defoliation of sugar maple orchards observed or reported in Bennington, Windsor, and Orange Counties. A few larvae had begun spinning cocoons at Bennington on June 19. White ash trees were entirely stripped at Bennington, but red maple was left practically untouched in the midst of defoliated sugar maples.

J. V. Schaffner, Jr. (June 24): On June 7 M. disstria was abundant in the vicinity of Dummerston, Putney, and Bellows Falls. Heavy feeding was noticeable chiefly on red oak, linden, poplar, ash, and paper birch. Between Addison and New Haven Junction heavy feeding was noted on June 6 on red oak, linden, and sugar maple, but it seemed to be in rather small patches.

New Hampshire. J. V. Schaffner, Jr. (June 24): On June 7 M. disstria was abundant at Charlestown and Walpole.

Massachusetts. E. P. Felt (June 25): The forest tent caterpillar is abundant at Williamstown where it is causing from partial to nearly complete defoliation in local areas.

J. V. Schaffner, Jr. (June 24): Very common throughout eastern Massachusetts. The foliage on one large area of oak woodland in Spot Pond Reservation, Stoneham, was severely damaged before it could be sprayed.

Connecticut. M. P. Zappe (June 19): Quite abundant in wooded areas in Salisbury, Canaan, and Colebrook, but not numerous enough to cause extensive defoliation.

New York. E. P. Felt (June 25): The forest tent caterpillar is abundant at Millbrook and Amenia, causing from partial to nearly complete defoliation in local areas.

N. Y. State Coll. Agr. News Letter (June 24): Forest tent caterpillars are pupating in Essex County.



J. V. Schaffner, Jr. (June 24): On June 6 a severe infestation was noted in woodlands near Port Henry. Many trees, especially oak, linden, and ash, were defoliated.

Pennsylvania. A. B. Champlain (June 17): First adults noted feeding June 15, in Dauphin County. Some larvae in field not yet pupated.

Michigan. R. Hutson (June 19): The forest tent caterpillar is causing considerable alarm in the raspberry sections of Cheboygan County. It is extremely abundant in three townships in the southwestern part of the county, where it is defoliating wood lots and red raspberry plantings.

Minnesota. A. G. Ruggles (June 21): A very extensive scourge of these caterpillars is stripping poplars and willows in northeastern part of the State.

#### CANKER WORM (Geometridae)

Connecticut. P. Garman (June 24): Unsprayed orchards in New Haven and Fairfield Counties are completely stripped of leaves in many places by Alsophila pometaria Harr.

M. P. Zappe (June ): Canker worms, chiefly A. pometaria are quite abundant throughout the State, many trees being defoliated in some sections. Northern counties are not as heavily infested as southern.

Massachusetts. J. V. Schaffner, Jr. (June 24): Canker worms A. pometaria were abundant in many localities through the eastern part of the State, principally on shade trees but in some places on apple. Serious defoliation was reported from Newton, Ipswich, Topsfield, and Waltham. Heavy feeding was also reported from many other towns.

Pennsylvania. T. L. Guyton (June 17): A. pometaria is defoliating apple and elm in Lawrence County.

Ohio. T. H. Parks (June 10): Both the fall cankerworm (A. pometaria) and the spring cankerworm (Paleacrita vernata Peck) have been causing much defoliation of elm trees in many northwestern counties. Many beautiful elms are almost stripped of leaves by the hordes of worms. Unsprayed orchards are also being attacked. The infestation extends over the entire northwestern quarter of the State. Sprayed orchards are not being injured.

E. W. Mendenhall (June 12): Spring cankerworms are very injurious in neglected farm orchards in Clark County. Some of the trees are entirely defoliated.

Wisconsin. E. L. Chambers (June 20): Many neglected farm orchards between Waupun and Green Bay were defoliated by cankerworms.

#### SATIN MOTH (Stilpnotia salicis L.)

Oregon. C. A. Cole (June): S. salicis is stripping silver and lombardy poplars of leaves in Clackamas, Marion, Polk, and Yamhill Counties.



GYPSY MOTH (Porthetria dispar L.)

Maine. H. B. Peirson (June 22): The gypsy moth was hatching on May 11 in Acton. It was very abundant in Alfred, Brownfield, and Kezar Falls on June 18.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Tennessee. G. M. Bentley (June 19): Prior to 1916 practically no reports came in on this insect and comparatively few infestations were found. Since that year, however, the number of reports has increased each year. Few parasites can be reared from the overwintering forms.

Alabama. J. M. Robinson (June 20): Bagworms have been very abundant generally over the State. The larvae have attacked cotton at Huntsville and have defoliated arborvitae plantings, as well as various ornamental shrubs and deciduous trees at Auburn, Talladega, Wetumpka, and Tallassee.

ASHA MIRID (Neoborus sp.)

Connecticut and Pennsylvania. E. P. Felt (June 22): An ash plant bug, Neoborus sp., has been somewhat common on ash at Stamford, Conn., and also in the Philadelphia area, attracting notice by its abundance.

BEECHWOOLLY BEECH APHID (Phyllaphis fagi L.)

New York. R. E. Horsey (June 20): Woolly beech leaf aphid is quite numerous on the leaves of an ornamental European beech at Rochester.

Maryland. E. N. Cory (June 18): Woolly beech aphid observed on copper beech at Baltimore.

ELMELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Idaho. R. W. Haegele (June 19): Infestation considerably reduced from outbreak numbers of 1934. Eggs hatching by June 10.

California. H. J. Ryan (July 1): The elm leaf beetle has been found for the first time in Los Angeles County infesting a planting of 14 cork elms and 2 American elms on a ranch about 12 miles from the northern boundary of the county. This is in all probability an extension of the infestations which have occurred for some years in the vicinity of Bakersfield, Kern County. On June 27 approximately 30 percent of the leaves on the cork elms showed injury and larvae were quite numerous. A considerable number of larvae

and pupae were found on the soil at the base of the tree. Adults and fresh egg clusters were rare. According to the ranch foreman, damage was first noted in the summer of 1934 when the cork elms were almost entirely defoliated.

Kern County Agr. Comm. Monthly News Bull. (June 4): We are spraying shade trees for the elm leaf beetle.

LESSER EUROPEAN BARK BEETLE (Scolytus multistriatus Marsh.)

New Jersey. F. M. Wadley (June 10): Found at Belleville and Parsippany.

A BARK BEETLE (Hylurgopinus rufipes Eich.)

Connecticut. B. J. Kaston (June): Adult beetles abundant in Torrington, Riverton, and Winsted, where most of them have entered relatively live branches to breed, starting about June 5. Somewhat less abundant in the vicinity of New Haven, where they started breeding tunnels about June 12.

LIME-TREE LOOPER (Erannis tiliaria Harr.)

Connecticut. M. F. Zappe (June 18): Elm trees in Salisbury and Lakeville villages partially defoliated. Larvae present on practically all trees in woods in Salisbury and Canaan.

ELM LEAF APHID (Tuberculatus ulmifolii Monell)

New York. R. E. Horsey (June 20): A few elm leaf aphids found on American elm at Rochester on June 19. Said to be sometimes numerous in summer but I have never noticed serious injury.

Nebraska. M. H. Swenk (June 14): The elm aphid was reported attacking elms in Gage County the second week in June.

Kansas. H. R. Bryson (June 27): Elm leaf aphids have been very abundant in the State this season. The ladybeetles and their larvae have been responsible for getting this pest under control.

Oklahoma. F. A. Fenton (June 24): A very severe outbreak of the elm leaf aphid. Aphids were so numerous that they caused the elms to shed many leaves that were not curled or discolored.

WOOLLY ELM APHID (Eriosoma americana Riley)

Maryland. E. N. Cory (June 8): Woolly aphid found attacking elm at Laurel.

Ohio. T. H. Parks (June 25): We have received many samples of elm leaves badly infested with the woolly aphid. This pest is more injurious than I have ever seen it on elms and is generally distributed.



EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. R. E. Horsey (June 20): A considerable amount of European elm scale on seedling American elms, 20 feet tall. A common pest in and near Rochester, when not kept under control by proper spraying.

Maryland. E. N. Cory (June 10): Imported elm scale attacking elm at Baltimore.

Indiana. J. J. Davis (June 25): The European elm scale was reported as destructive to elms at Fort Wayne on May 29.

Ohio. J. S. Houser (June 15): Many complaints have been received this year. Serious damage to elms set for shade and ornamental purposes is quite common. The young scales have not yet appeared in northern Ohio.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouché)

New York. R. E. Horsey (June 20): A few European fruit lecania on American elm seedlings at Rochester.

Oklahoma. F. A. Fenton (June 24): The European fruit lecanium hatched in great numbers late in May and most of the crawlers were located on the leaves by May 31. Indications are that this will be a serious pest of elms in certain sections of Oklahoma next year.

ELM LEAF MINER (Kaliosysphinga ulmi Sund.)

Maine. H. B. Peirson (June 22): Elm leaf miner abundant on English elm at Springvale.

New York. E. P. Felt (June 22): The elm sawfly miner has been extremely abundant and injurious to certain Scotch elms at New Rochelle.

R. E. Horsey (June 20): Very noticeable on a group of seedling or coppice growth of American elms, trees to 20 feet tall at Rochester. It was numerous on this group, some leaves being entirely mined.

FIR

A CURCULIONID (Cylindrocopturus sp.)

Washington. R. R. Furniss (May): A small weevil, Cylindrocopturus sp., was discovered this month, causing appreciable damage to a naturally seeded, recently thinned 10-year-old stand of Douglas fir near La Grande and in open mature stands in several localities of central-western Washington. What apparently is the same species has been reared by W. W. Baker from Douglas-fir twigs taken near Puyallup.

BALSAM TWIG APHID (Pinus abietinus Koch)

Maine. H. B. Peirson (June 12): The balsam twig aphid is abundant on new growth of balsam fir at Augusta.



HEMLOCKA SPANWORM (Ellopia athasaria Walk.)

Massachusetts. J. V. Schaffner, Jr. (May): An infestation is heavy over an area of about 10 acres. Many hemlocks were severely defoliated in 1934. Random samples of leaf mold showed a population of approximately 4 pupae per square foot. Moths began issuing on May 24 and emergence has continued to the end of May.

JUNIPERJUNIPER WEBWORM (Dichomeris marginellus Fab.)

Maryland. E. N. Cory (June 10): The juniper webworm is attacking juniper at Halfway.

Ohio. J. S. Houser (June 20): Irish juniper and also some prostrate forms of juniper at Strongville and Ashland are seriously damaged. Reports of damage are becoming more plentiful from year to year.

LARCHLARCH CASE BEARER (Coleophora laricella Hbn.)

General. J. V. Schaffner, Jr. (June 24): Severe infestations persist in stands of both the American and the European larch throughout New England and northern New York. Almost complete browning of the foliage, caused by the feeding, was noted in many localities in New York, Vermont, New Hampshire, Maine, and Massachusetts. In a plantation of European larch at Woodstock, Conn., from 25 to 50 percent of the foliage was browned.

Maine. H. B. Peirson (June 22): The larch case bearer is very abundant generally throughout central and southern Maine. Trees are nearly totally browned.

Vermont. H. L. Bailey (June 24): The larch case bearer is more abundant than was anticipated last month. Every larch throughout wide areas is completely browned.

Connecticut. M. P. Zappe (June 19): This insect has been abundant for several years. This year hardly a tree in Litchfield County has escaped severe injury. Many trees are entirely brown but a few still have a little green foliage. Observed in Salisbury, Canaan, and Norfolk.

LOCUSTLOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Mississippi. C. Lyle (June 22): The locust leaf miner was reported as causing serious damage to young black locust plantings at Grenada and Carrollton on June 14.

MAPLEWOOLLY ALDER APHID (Prociphilus tessellatus Fitch)

New York. C. R. Crosby (May 16): Specimens received from Binghamton, where they were attacking alder.

Maryland. E. N. Cory (June 21): Alder blight aphid attacking maple at Prince Frederick.

NORWAY MAPLE APHID (Periphyllus lyropictus Kess.)

Delaware. L. A. Stearns (June 20): Moderate infestation on Norway maple at Frederica reported; specimen submitted.

MAPLE BLADDERGALL (Phyllocoptes quadripes Shim.)

Vermont. H. L. Bailey (June 24): The bladder maple gall is unusually abundant in Washington County.

Connecticut. W. E. Britton (June 24): Attacking silver maple at Clinton, Devon, Windsor, West Hartford, and Pomfret; normal abundance.

Maryland. E. N. Cory (May 22): Bladder maple gall attacking maple leaves at Baltimore.

OAKA GALL WASP (Neuroterus irregularis O. S.)

Connecticut. E. P. Felt (June 22): The gall wasp N. irregularis developed in immense numbers on several swamp white oaks at Greenwich. The infestation was so severe that practically three-fourths of the normal leaf tissue was transformed into galls and a small branch was almost as heavy as a similar apple branch fairly loaded with fruit.

PINEEUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

New York. R. E. Horsey (June 20): A slight infestation on mugho pine was described to me on June 15. I visited these pines recently and failed to find any caterpillars. In 1932 severe infestations on young pines in widely separated areas in western New York were reported but I have heard of none lately.

New Jersey. F. A. Soraci (June 24): Adults of the European pine shoot moth were observed on red pine at Trenton as early as June 3.

PINE LEAF MINER (Paralechia pinifoliella Chamb.)

Maine. H. B. Peirson (June 22): Rather heavy infestation of vines on May 25 at Bar Harbor. Abundant in foliage of witch vine at Berwick on June 18.

New England States. J. V. Schaffner, Jr. (June 24): Severe infestations were noted this month in stands of pitch pine at Brimfield and Natick, Mass., between Glen Falls and Lake George, N. Y., and at Wells and Kennebunk, Maine.

SOUTHERN PINE BEETLE (Dendroctonus frontalis Zimm.)

Mississippi. H. Gladney (June 19): A small infestation of the southern pine beetle is occurring near Ocean Springs.

PINE BARK APHID (Pineus strobi Htg.)

Maine. H. B. Peirson (June 22): Pine bark aphid abundant throughout a 50-acre plantation of white and Scotch pine at Brookbay.

SPRUCE

SPRUCE GALL APHID (Chermes abietis L.)

New York. R. E. Horsey (June 20): A considerable number of galls caused by this insect found on Norway and white spruce. Most of the galls are green and still growing, but I was surprised to find that a few galls on Norway spruce were cracking open and the adults emerging on June 19. This aphid at times is a serious pest in Rochester. A few galls were also found on Colorado blue spruce, caused by this or a related insect.

A SAWFLY (Neodiprion dyari Rohw.)

Massachusetts. J. V. Schaffner, Jr. (June 24): During the first 3 weeks in June the larvae were very noticeable on pitch pine in many localities through eastern Massachusetts.

WHITE SPRUCE SAWFLY (Neodiprion polytomum Htg.)

Maine. H. B. Peirson (June 22): One adult of the white spruce sawfly was taken at Bar Harbor on June 3.

SPRUCE LEAF MINER (Recurvaria piceaella Kearf.)

Ohio. E. W. Mendenhall (June 4): The spruce leaf miner is quite common in private plantings of blue and Norway spruce and Douglas fir in Urbana.



SWEETBAYA WEEVIL (Prionomerus calceatus Say)

Connecticut. E. P. Felt (June 22): Sweetbay leaves were sent in accompanied by a statement that this weevil had been feeding on the foliage. This insect is a well-known miner of the related sassafras and tulip tree.

WILLOWEUROPEAN WILLOW BEETLE (Plagiodera versicolora Laich.)

Massachusetts. J. V. Schaffner, Jr. (June 25): The imported willow leaf beetle is abundant on willow in suburban towns around Boston. Adults of the first brood are now issuing.

A SPITTLE BUG (Aphrophora salicis DeG.)

Massachusetts. J. V. Schaffner, Jr. (June 25): This imported spittle insect is quite abundant on willow in the suburban towns around Boston.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

STRAWBERRY ROOT WEEVIL (Brachyrhynchus ovatus L.)

Minnesota. A. G. Ruggles (June 21): Adults of the strawberry root weevil were taken from Duluth, Saint Paul, and Minneapolis. A few good-sized evergreens have been injured by grubs.

Utah. G. F. Knowlton (June 17): Strawberry root weevils have killed third-year strawberries in spots at Hobble Creek, Springville, and Springdale.

GARDEN SPRINGTAIL (Bourletiella hortensis Fitch)

Maine. H. B. Peirson (June 10): The garden springtail is very abundant at Bar Harbor.

CHRYSANTHEMUMCHRYSANTHEMUM GALL MIDGE (Diarthronomyia hypogaea Loew)

Mississippi. C. Lylé (June 22): The chrysanthemum midge was found on a few plants at Meridian on June 21. This insect is not widely distributed in Mississippi.

IVYMAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. E. P. Felt (June 22): Magnolia scale was found breeding in large numbers on Boston ivy at Mamaroneck.

A FULGORID (Ormenis septentrionalis Spin.)

Alabama. J. M. Robinson (June 20): The lantern fly was reported as very abundant on English ivy at Union Springs in Bullock County.

PHLOXPHLOX PLANT BUG (Lopidea davisi Knight)

Maryland. E. N. Cory (June 22): The phlox plant bug has been reported attacking phlox at Hyattsville.

ROSEROSE APHID (Macrosiphum rosae L.)

Nebraska. M. H. Swenk (June 15): The rose aphid was reported attacking rose bushes during the period May 20 to June 15.

Utah. G. F. Knowlton (June 7): Aphids are injuring roses in many parts of northern Utah.

SPINY ROSE GALL (Rhodites bicolor Harr.)

Nebraska. M. H. Swenk (June 14): The spiny rose gall was reported present on rose bushes in Douglas County on May 26.

ROSE CURCULIO (Rhynchites bicolor Fab.)

Utah. G. F. Knowlton (June 17): Rose curculio injury to rose buds was observed at Joseph, Logan, and Brigham.

ROSE SAWFLY (Caliroa aethiops Fab.)

Tennessee. G. M. Bentley (June 19): Many reports of sawflies attacking rose leaves in all parts of the State. Abundance about the same as last year, but 50 percent increase as compared with last month's reports.

SNOWBALLSNOWBALL APHID (Aphis viburnicola Gill.)

Wisconsin. E. L. Chambers (June 20): American varieties of snowball growing throughout the State are heavily infested with aphids this year.

North Dakota. J. A. Munro (June 18): Snowball aphids are abundant in Fargo and vicinity.

Nebraska. M. H. Swenk (June 15): The snowball aphid was reported attacking snowball bushes during the period May 20 to June 15.

## INSECTS ATTACKING MAN AND DOMESTIC ANIMALS

### MAN

#### BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

South Carolina. F. Sherman and W. C. Nettles (June 21): Specimens have been received from various localities.

Mississippi. C. Lyle (June 22): On account of much newspaper publicity great interest has been shown in the black widow spider and dozens of letters regarding it have been received.

Utah. G. F. Knowlton (June 17): Reports of black widow spiders in abundance have been received from Washington County.

Oregon. D. C. Mote (June): One female was collected on February 15; oviposition, March 17, 20, 23; egg hatching, May 17, 27, and June 3 at Corvallis. Laboratory observations.

#### AMERICAN DOG TICK (Dermacentor variabilis Say)

Wisconsin. E. L. Chambers (June 20): Wood ticks apparently much more abundant in the woods of the State than for several summers. Crews of workmen in the white pine stands report considerable annoyance from them.

#### PAJAROELLO (Ornithodoros coriaceus Koch)

California. C. S. Robinson (July 5): This species of tick is causing considerable annoyance and discomfort to campers and field men in the Santa Barbara National Forest. These ticks are commonly found under trees and places where horses and cattle congregate, and people should avoid sleeping or resting in such places.

### CATTLE

#### SCREW WORMS (Cochliomyia spp.)

General. F. C. Bishopp (July 5): The heavy rains and the resulting humidity in certain sections of western Texas during June have created very favorable conditions for the breeding of an enormous number of screw worm flies. Reports from field stations in this area state that ranchmen



face the most severe outbreak in a number of years. Hail storms and floods have killed large numbers of livestock and wild animals, therefore the population of the secondary screw worm fly (C. macellaria Fab.) has been increased enormously. In addition to injuring livestock by infesting wounds initiated by the primary screw worm fly (C. americana Cushing and Patton), C. macellaria has attacked the fleece of many sheep whose wool has become sour or foul as the result of being kept wet by continued rains. In Georgia screw worm cases have been reported from 110 counties but the number of cases in any one county is not large, 140, reported from Thomas county, being the maximum number. As it was not possible to examine all the cases, the species of fly causing the trouble was not determined. Twenty cases attributed to screw worms were reported from 10 counties in South Carolina for the week ending June 22. Specimens of larvae were not obtained in these cases and the species involved was not determined. In Louisiana, Mississippi, and Alabama the infestations are comparatively few. Records obtained from Jefferson Davis and Calcasieu Parishes, La., report 77 cases for the week ending June 22; however, it has been determined that some of these infestations were due to Phormia regina Meig. For the same period 36 counties in Mississippi reported 116 cases, and in Alabama 89 cases were reported from 35 counties. The most severe outbreak of screw worms in the Southeast is in Florida. The number of cases is rapidly increasing and the flies are spreading to new localities. The heaviest infestations occur in the central counties. The total number of infestations in the State has been reported as 23,000, with Sumter County having 2,500, the maximum number for any one county.

### HORSE

#### HORSE FLIES (Tabanus spp.)

Delaware. L. A. Stearns (June 18): An abundance of T. daeckei Hine is causing great annoyance to livestock along the coast.

Missouri. L. Haseman (June 26): During the latter half of June there has been a real outbreak in central Missouri of one species of horse fly annoying cattle and horses, and even attacking man.

Oklahoma. F. A. Fenton (June 24): Two species of horse flies are unusually abundant. They are T. equalis Hine, an evening flier, and T. erythraeus Hine, a species active during the day.

#### BUFFALO GNATS (Eusimulium spp.)

North Dakota. J. A. Munro (June 23): During the latter part of May reports from Valley City, in Barnes County, indicated that buffalo gnats were very abundant in pastures and were causing much disturbance among cattle.

Iowa. C. J. Drake (June 24): The black fly (E. occidentale Towns.) was quite common in northwestern Iowa this spring. In one of the State parks in Sioux County it was impossible for men or horses to remain in the park during the peak of the emergence period. Farmers in the

vicinity of the park reported that they lost many chickens from the bites of flies.

### SHEEP

#### BLACK BLOWFLY (Phormia regina Meig.)

Texas. F. C. Bishopp (July 5): The wool maggot fly has been unusually abundant this season and has caused much trouble to ranchmen.

### HOUSEHOLD AND STORED - PRODUCTS INSECTS

#### TERMITES (Reticulitermes spp.)

Connecticut. N. Turner (June 24): Twenty-seven infested buildings were examined during the past month.

Delaware. L. A. Stearns (June): Serious damage to a dwelling examined at Newark on June 14.

Maryland. E. N. Cory (June 22): The number of calls received in regard to termites in widely scattered portions of the State is increasing. The entire basement floor of a church in Brunswick had to be replaced on account of the activities of R. flavipes Koll.

Tennessee. G. M. Bentley (June 19): From observations and reports, termites are becoming more abundant each year in all parts of Tennessee.

Nebraska. M. H. Swenk (June 14): R. tibialis Bks. was reported to be infesting residences in Nance, Douglas, Seward, and Clay Counties.

Oklahoma. F. A. Fenton (June 24): A large number of reports have been received of termite damage, mostly from the central part of the State.

#### ANTS (Formicidae)

Virginia. H. G. Walker (June 25): Ants rather seriously injured several fields of eggplants near Norfolk by eating off the roots and barking the stems just below the surface of the ground.

Mississippi. C. Lyle (June 22): Many complaints have been received during the month. Most of them are in regard to the fire ants Solenopsis xyloni McCook in flower and vegetable gardens.

Nebraska. M. H. Swenk (June 15): Ants in lawns have been very troublesome during the entire period from May 20 to June 15, but especially during the second week in June. The carpenter ant (Camponotus herculeanus pennsylvanicus DeG.) was reported on May 21 as working in two porches in Nance County.

Kansas. H. R. Bryson (June 27): The kafir ant (S. molesta Say) was reported to be causing injury to seed corn at Manhattan.

LEAD CABLE BORER (Scobicia declivis Lec.)

California. C. K. Fisher (June 4): The lead cable borer has been observed boring into wine barrels in a Fresno winery since about May 21. In 1934 the damage from this species began about April 26.

CERAMBYCIDS (Callidium spp.)

Connecticut. R. B. Friend (June 24): At Winsted C. violaceum L. and C. antennatum Newm. severely attacked white pine lumber that had bark on the edges. Hymenopterous parasites were abundant this month. Adult beetles were very abundant the first part of June.





# INSECT PEST SURVEY BULLETIN

Vol. 15

August 1, 1935

No. 6

## THE MORE IMPORTANT RECORDS FOR JULY 1935

The grasshopper and chinch bug situations have not materially changed since our last report.

The occurrence of two Asiatic weevils, Myloccerus castaneus Roelofs and Calomycterus setarius Roelofs, in the Middle Atlantic States was probably the most interesting feature of the month. M. castaneus was first collected in 1933 at Montclair, N. J., and was again collected this year at the same place. Although this species is not recorded as a pest in Asia, the genus contains many species that are crop pests, and one a very serious pest of cotton in India. C. setarius was first collected in this country at Yonkers, N. Y., in 1929. In 1932 it was reported as injuring iris and other plants in Connecticut, and this year it was again found in that State attacking greenhouse plants, and was found in enormous numbers in Maryland and Pennsylvania feeding on a wide variety of plants.

The Japanese beetle was occurring in increasing numbers in the central portion of the main infested area, and in the outlying parts of the generally infested area the populations are decidedly on the increase.

Common red spiders occurred in destructive numbers from Maryland to Florida and westward to Nebraska and Mississippi, with isolated reports from the Great Basin and the Pacific Northwest.

Early in the month the corn ear worm was reported quite generally throughout the Northern States as doing serious damage to tomatoes in many sections. During the latter part of the month it was reported as injuring corn.

Scouting for the alfalfa weevil has resulted in the finding of this insect in Sioux and Scotts Bluff Counties, Nebr.; Montezuma County, Colo.; Kane County, Utah; Clark County, Nev.; Coconino County, Ariz., and Mendocino County, Calif.; and in confirmation of its occurrence in Malheur, Baker, and Union Counties, Oreg., as well as in various other counties previously known to be infested.

The apple maggot emerged later than usual in New England and New York and was appearing early in July in Michigan and Wisconsin.

The plum curculio is apparently less troublesome than was at first anticipated, dry weather preventing the new beetles from depositing many eggs, particularly in the Fort Valley peach-growing district of Georgia.

The oriental fruit moth appeared to be decidedly on the increase from the East Central States southward to Tennessee and Mississippi.

A localized outbreak of the cherry leaf beetle was reported from western Maryland and West Virginia.

The Colorado potato beetle appeared in unusually destructive numbers from Ohio and Indiana westward to Minnesota and the Dakotas.

The Mexican bean beetle was reported from central Iowa, far west of its known distribution outside of the Rocky Mountain region.

The imported cabbage worm is generally prevalent and destructively abundant from Ohio to Minnesota and Kansas, and is reported as doing considerable damage in Utah.

Curly top destroyed many plantings of tomatoes in southwestern Idaho and northern Utah.

Cotton aphid infestations were reported from the entire Cotton Belt, but especially from areas where arsenicals had been used extensively to control the boll weevil and cotton leaf worm.

The satin moth was found in eight counties in the Willamette Valley of Oregon.

The bagworm was reported as destructively abundant throughout the New England, Middle Atlantic, East Central, and Gulf Coast States.

The elm leaf beetle was reported as seriously damaging elms throughout the New England and Middle Atlantic States, southward to North Carolina, and westward to Ohio. Severe defoliation of elms was also reported from the Pacific Northwest.

The screw worm continued to cause enormous losses to livestock in Texas, whereas in the Southeastern States losses have been far less serious during the month.



## GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

- Wisconsin. E. L. Chambers (July 23): Although grasshoppers are prevalent over most of the infested area, the losses have been restricted to parts of less than a dozen counties where local rains have not been heavy.
- North Dakota. F. D. Butcher (July 7): Third-instar and fourth-instar nymphs of the clear-winged grasshopper (Camnula pellucida Scudd.) were migrating across the highway from a pasture to a small-grain field, in a strip about 10 rods wide, at Hurdsville, Wells County. (July 12): In a population of about 12 grasshoppers per square yard, Melanoplus mexicanus Sauss. was the predominant species. In a population composed of forms ranging from third-instar nymphs to adults, less than 1 percent had reached the adult stage at Ellendale and Lisbon, where the concentration was about 5 per square yard.
- South Dakota. H. C. Severin (July 22): Infestations are very spotted and range from very light to heavy. Some damage has been done to gardens, small grain, and alfalfa. Range grass has suffered slightly.
- Iowa. H. E. Jaques (July 22): Many grasshopper nymphs are now in evidence in southeastern Iowa.
- Nebraska. M. H. Swenk (July 15): Mild and isolated infestations developed in Thomas and Cheyenne Counties, but there have been no serious depredations anywhere in the State.
- Kansas. H. R. Bryson (July 27): M. bivittatus Say and M. differentialis Thos. are not so plentiful this year. (July 24): Pardalophora halde-manii Scudd. flew to the lights in the city of Manhattan and caused considerable annoyance. They were plentiful from July 3 to July 15 and were most numerous on July 13. A similar flight occurred at Wakefield on July 15.
- Oklahoma. C. F. Stiles (July 22): Grasshoppers of various species are appearing in large numbers in some of the central counties of the State and also in practically all of the northwestern counties that were so hard hit by the drought last year. The center of infestation seems to be in Roger Mills, Ellis, and Major Counties. M. mexicanus, the species that usually causes most of the damage in Oklahoma, is quite numerous. Some poisoning is being done.
- Idaho. C. Wakeland (July 24): Grasshoppers are moderately abundant in a few localities of Gem and Washington Counties and Federal grasshopper bait is being used for control. Populations are very low in the rest of the State and we have had no reports of control being necessary.

Utah. G. F. Knowlton (July 11): Warrior grasshoppers (C. pellucida) have hatched out in considerable numbers in meadow land 6 miles north of Randolph.

C. J. Sorenson (July 20): C. pellucida is moderately abundant in Cache and Millard Counties. Nymphs of another species were very abundant on June 26.

Oregon. D. C. Mote (July): All leaves of second-stand alfalfa on 65 acres at Oakridge have been consumed by nymphs.

#### MORMON CRICKET (Anabrus simplex Hald.)

Idaho. C. Wakteland (July 24): The most interesting thing to report this month is parasitization of the Mormon cricket by the hairworm Gordius villoti Rosa. Farmers are of the opinion that about 50 percent of the crickets they mashed when destroying them around their gardens contained hairworms, but when I investigated last week I found that only 1 cricket out of 300 dissected was parasitized. However, dead crickets were numerous in the streams and apparently the cycle of Gordius had already been passed inside the cricket bodies.

#### EUROPEAN EARWIG (Forficula auricularia L.)

Rhode Island. L. H. Worthley (July 15): Weather conditions have proved ideal for this species and heavy infestations have occurred in Newport County. An eradication campaign is under way.

#### CUTWORMS (Noctuidae)

Nebraska. M. H. Swenk (July 15): The variegated cutworm (Lycophotia margaritosa saucia Hon.) was present in outbreak proportions from June 19 to 27. Damage was chiefly in the alfalfa, corn, and potato fields and in the gardens of southeastern Nebraska. After the close of this outbreak a later isolated outbreak occurred in the alfalfa fields of central Nebraska from July 5 to 10. In Loup County these cutworms took as high as 25 percent of the alfalfa in several fields before the poisoned-bran bait could be used to check them.

California. A. E. Michelbacher (July 22): The yellow-striped armyworm (Prodenia praefica Grote) was very abundant at Vernalis on July 19. In one alfalfa field at least it was doing considerable damage. The feeding was heavy enough to be observed at some distance.

#### ARMYWORM (Cirphis unipuncta Haw.)

Ohio. E. W. Mendenhall (July 8): The armyworm is very destructive to rye fields and meadows in Champaign and Madison Counties.

Indiana. J. J. Davis (July 24): Armyworms have been reported from practically all sections of the State. The reports from June 24 to July 3



came from the northern half. Timothy, wheat, rye, and corn are the crops attacked.

Iowa. H. E. Jaques (July 22): Armyworms are still in evidence but danger of serious damage seems to have passed. An unusual abundance of Archytas analis Fab. is being found. As this is often the outstanding parasite of the armyworm in this part of the country, its abundance indicates a great reduction in the number of armyworm moths.

Missouri. L. Haseman (July 22): Moths of the armyworm are now on wing, feeding on the juice of over-ripe peaches and apples.

Nebraska. M. H. Swenk (June 30): The outstanding insect pest of the second half of June was the true armyworm, of which many complaints of damage to rye, wheat, corn, and alfalfa were received. These reports of damage came chiefly from the southeastern corner of the State. In many cases the damage was serious, although there were but few instances of migration.

#### FALL ARMYWORM (Laphygma frugiperda S. & A.)

Mississippi. C. Lyle (July 23): An outbreak of the southern grassworm is occurring in the southern part of the State. Specimens have been received from Liberty, in Amite County, and from Sandy Hook, in Marion County. One correspondent reported that corn in some fields had been reduced to stubs.

#### BERTHA ARMYWORM (Barathra configurata Walk.)

North Dakota. J. A. Munro (July 28): There are spotted infestations in the central part of the State. Near Jamestown, in Stutsman County, in a 75-acre field of flax, 35 acres had already been stripped on July 25. The worms were invading the remainder. Another 30-acre flax field nearby showed only slight damage and light infestation. On July 27 we looked over several fields of flax northeast of Bismarck, in Burleigh County. The damage ranged from a negligible amount to complete destruction. We saw an 80-acre field of flax that was completely stripped. On July 28, one 30-acre field of flax, northwest of Mandan, in Morton County, had a patch of 7 or 8 acres destroyed, and the worms were working into the remainder. Other fields inspected showed less injury. Examinations to date have shown the worms to be most abundant in weedy flax fields. In one field near Jamestown natural mortality of the armyworms ranged from 25 to 70 percent in different parts of the field, averaging about 40 percent. The cause of the mortality was not determined but is believed to be due to the combined attack of disease and predators.

#### WIREWORMS (Elateridae)

Wisconsin. E. L. Chambers (July 23): Wireworms were unusually injurious to corn, onions, potatoes, and other crops planted on heavy black soil, especially where drainage was poor, in Milwaukee and Kenosha Counties.



Nebraska. M. H. Swenk (July 15): On June 25 the upland corn wireworm (Melanotus pilosus Blatch.) was found working in young corn in Merrick and Lancaster Counties. This pest was complained of as destroying onions in Grant County on June 23. On July 6 the wireworm was found badly injuring a potato field in Antelope County.

Kansas. H. R. Bryson (July 27): Monocrepidius sp. reported injuring potato tubers and the roots of tomatoes at Peru on June 25.

Washington. M. C. Lane and H. P. Lanchester (July): Severe injury by Pacific coast wireworms (Pheletes canus Lec.) to spring onions and cantaloup has been noted in several fields near Walla Walla during the past month. In one cantaloup field over 20 percent of the hills were totally destroyed. Careful damage counts showed from 8 to 15 percent of the onions culled out for injury in one field alone.

K. E. Gibson (July 18): An investigation in the district near Sunnyside showed that where it had been necessary to make a second seeding of sugar beets, the first seeding having failed because of adverse weather conditions, the second planting had, in many instances, been heavily damaged by wireworms. A number of tracts of sugar beets of from 3 to 5 acres had been destroyed.

#### A WEEVIL (Myllocerus castaneus Roelofs)

New Jersey. A. C. Davis (June 30): On June 30 three specimens of this weevil were taken a short distance from Montclair. One was beaten from wild grape, another from oak, and the third from ash(?). The insect seems to be a general feeder. (Det. by L. L. Buchanan.) (This species was first collected in the United States in August 1933 at Montclair. It was originally described from Japan in 1873. In 1884 it was recorded from Russian Siberia. Practically nothing is known of the habits of this species but it belongs to a large genus of over 90 species. The greater number of the species are in India and the East Indies, a few are in Africa, and one in Australia. One species, M. blandis Boh., is a serious pest of cotton in Punjab, India. The different species of the genus are known to feed on a wide variety of food plants of which 44 have been recorded and among which may be mentioned such plants as cotton, tobacco, eggplant, potato, grapefruit, apple, sugarcane, tea, and cacao.)

#### JAPANESE BEETLE (Popillia japonica Newm.)

General. C. H. Hadley (July 30): The outstanding feature of the current beetle season is the very marked increase of the infestation and the severity of feeding on foliage, as compared with those of a year ago. Within the central part of the main area of infestation, where the insect was first found and in which it has been longest established, the beetle population is noticeably heavier than during the past several years, although not as yet reaching the peak infestations of 1924-27. In general, around the periphery of the area

of heaviest infestation, the beetle population considerably exceeds that of the past several seasons. The increase in abundance has also been especially noticeable in the large metropolitan areas of New York, Brooklyn, Philadelphia, Wilmington, and Baltimore. Beyond the main area of heavy beetle infestation, reports indicate that there is a corresponding increase in the population at points of local infestation. Injury to vegetation is noticeable this year for the first time.

Rhode Island, Massachusetts, and Connecticut. L. H. Worthley (July 15): State Japanese beetle traps in Rhode Island began catching beetles on July 2. By July 9 over 400 beetles had been caught, 262 being found on one property. Eleven beetles were caught in 25 traps set in South Boston, the first catch having been made on July 13. At Springfield, Mass., the first beetle was taken on July 1, and at Norwich, Conn., on July 3.

Connecticut. W. E. Britton (July 23): Adults have been more abundant than ever before in certain localities in Bridgeport, Hartford, and New Haven, and have caused some injury to plants.

New York. L. H. Worthley (July 29): Scouting for the Japanese beetle in nurseries and greenhouses in the Syracuse area was started on July 12. On July 15 discovery was made of a first-record infestation at Glens Falls, in Warren County. The scout crew collected 34 beetles within 300 feet of nursery premises in that city.

New York and New Jersey. M. Kisliuk, Jr., and E. Kostal (July 8): The first few adults of the Japanese beetle made their appearance on milkweed and ragweed in Jamaica, L. I., N. Y., on July 1, and on rose at Morganville, N. J., on June 29.

Delaware. L. A. Stearns (July): Adults present in great numbers and causing wide-spread injury around Wilmington; apparently near the peak of infestation for this district.

Maryland. E. N. Cory (July 24): Japanese beetles being reported quite frequently from the Baltimore area.

#### ROSE CHAFER (Macrodactylus subspinosus Fab.)

Maine. H. B. Peirson (July): Reported in central and southern Maine in June and July. Adults swarming and feeding abundantly on apple (especially the young fruit), red maple, silver maple, cherry, elm, alder, woodbine, phlox, daisies, corn, and beans.

Maryland. E. N. Cory (July 24): Early in June there was a heavy infestation of rose chafers.

Wisconsin. E. L. Chambers (July 23): Rose chafers have defoliated everything in their path in portions of Shawano and Monroe Counties.



A CHINCH BUG (Blissus hirtus Montd.)

New Hampshire. L. C. Glover (July 24): There have been a few reports of injury to lawns by chinch bugs.

Ohio. J. S. Houser (July 23): Despite abundant rains and copious artificial watering this chinch bug is thriving and numerous young are appearing at Cleveland. Dead patches in lawns have begun to appear.

SAY'S STINK BUG (Chlorochroa sayi Stahl)

California. H. J. Ryan (July 1): Say's plant bug was noted during the week of June 16 in considerable numbers on the south side of the Antelope Valley in a strip extending about 5 miles east and west of Palmdale, traveling across and through the sagebrush. Adults were in evidence flying from plant to plant, always in the direction of the foothills to the south, where great numbers of half-grown bugs were wandering aimlessly on the ground or resting on the plants. There are a few pear orchards in the line of travel, but no damage has been found in any of them.

COMMON RED SPIDER (Tetranychus telarius L.)

Maryland. E. N. Cory (July 24): The red spider is exceedingly numerous.

Georgia. O. I. Snapp (May 31): Very abundant and has seriously injured beans and other vegetables at Fort Valley. May has been an unusually dry month.

Florida. J. R. Watson (July 22): Red spiders have been rather common on citrus.

Ohio. N. F. Howard (July 23): Red spiders are becoming increasingly abundant on a variety of hosts in Columbus, viz.; soft maple, flowering beans, garden beans, and ornamentals.

E. W. Mendenhall (July 20): The red spider has been very injurious to raspberry plants near Carroll, in Fairfield County.

Indiana. J. J. Davis (July 24): On June 27 red spiders were destructive to beans and corn at Cedar Grove.

Nebraska. M. H. Swenk (July 1 to 15): One of the more outstanding pests of the period has been the red spider. Although many plants were attacked the most complaints concerned red raspberries, currants, beans, and bittersweet.

Kansas. H. R. Bryson (July 27): Red spiders have been unusually destructive during the past month on large American elms, vegetables, ornamental shrubs, grasses, and weeds.



Oklahoma. F. E. Whitehead (July 22): The red spider, which customarily appears in dry hot spells, is much worse than usual this spring, and in the vicinity of Stillwater a large variety of plants has been severely injured. Reports from over the State indicate that the infestation is more or less general.

Idaho. R. W. Haegele (July 22): In a few places the common red spider increased to injurious numbers during July.

Utah. G. F. Knowlton (July 22): Red spiders are damaging raspberries.

Oregon. D. C. Mote (July): Two-spotted mites at Milton and Freewater. Considerable injury on prune foliage.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT AND OTHER SMALL GRAINS

#### HESSIAN FLY (*Phytophaga destructor* Say)

Ohio. T. H. Parks (July 25): Hessian fly increased greatly during the spring, but was not responsible for heavy loss in yield. Most of the infested straws remained standing and there was usually one flaxseed per straw. The heaviest infestation was found in Seneca County, where 54 percent of the straws were infested. The infestation was heaviest in counties having the most early sown wheat.

J. S. Houser (July 23): There has been a sharp increase in hessian fly abundance in Ohio this season. Some very heavily infested fields have been found. In some fields examined many of the flax-seeds are located high up on the straw.

Oklahoma. C. F. Stiles (July 22): Quite heavy infestation has been reported at Jefferson in Grant County.

#### WHEAT STEM MAGGOT (*Meromyza americana* Fitch)

North Dakota. F. D. Butcher (July 17): Traces of the wheat stem maggot were observed in several wheat fields in Dickey and Ransom Counties. In a rye field in which the white heads were conspicuous, a count revealed 1 percent of the straws attacked.

#### BLACK GRAIN-STEM SAWFLY (*Trachelus tabidus* Fab.)

Ohio. J. S. Houser (July 23): This insect has extended its range in Ohio this year, having been found as far west as Wooster and 33 miles north of Marietta. Some heavily infested fields in Mahoning and Columbiana Counties. Because of the heavy stand, infested wheat did not lodge as severely as did the fields with thin stands in 1934. From last year's observations, as well as from those of this season, this insect bids fair to become a major wheat pest.

GRASS THRIPS (Anaphothrips obscurus Mull.)

Ohio. N. F. Howard (July 23): Oat bugs are very numerous as oats are ripening and being cut and are very annoying to rural residents.

Indiana. J. J. Davis (July 24): The oats bug has been especially abundant and annoying in the northern half of the State, where it is not an annual event. Definite reports of unusual abundance have come from Bluffton, Portland, Winchester, LaFayette, and Monticello.

CORNCHINCH BUG (Blissus leucoconterus Say)

Ohio. T. H. Parks (July 25): Until the second week in July rains killed chinch bugs nearly as fast as they hatched. Since that time isolated farms have been infested with migrating late-hatched bugs that have not done serious damage because the corn was well along. In one western Ohio area that was missed by most of the rains the bugs have been marching into cornfields since July 10. Barriers have been necessary in this area and on isolated farms in 10 other counties. The bugs are now almost out of the wheat stubble.

Indiana. J. J. Davis (July 24): Chinch bugs have been persistent, notwithstanding adverse weather conditions. In the areas along the west side of the State, where the heaviest infestations occurred in 1934, the bugs have been largely wiped out. This, perhaps, was largely due to the white-mold fungus. The bugs in this region went into winter quarters in superabundance, but were evidently weakened from scarcity of food due to drought; then followed wet weather last spring. Thus the old bugs were emaciated and, with the high humidity, most of them succumbed. In the eastern part of the State the bugs were not emaciated, they were not so crowded in their winter quarters, and, notwithstanding excessive moisture, the white-mold fungus was not a significant factor. However, the continuous driving rains have held the young bugs in check and even in areas where they still continue in large numbers, they are not migrating freely because of excessive grassy growths in grain stubble. If we have normal weather the remainder of the season we can anticipate an appreciable amount of damage by the second generation of bugs and throughout the northern two-thirds of the State a carryover of bugs that would threaten the 1936 crop.

Illinois. W. P. Flint (July 24): Wet weather has continued during July and reduced the chinch bugs to such an extent that migration from small-grain fields to corn occurred in less than 1 percent of the small-grain fields. The only areas where any general migrations occurred were sand areas in the northwestern and southeastern parts of the infested section of the State.

Wisconsin. E. L. Chambers (July 23): No appreciable damage was observed



Iowa. C. J. Drake (July 29): Chinch bug migration is still in progress. A little damage is being done in cornfields. In most cases farmers have erected barriers. The infestation is confined to the eastern portion of the State, being heaviest from Cedar Rapids to Clinton and south to Burlington. In the fall of 1934 many farmers planted rye. Late this spring many of the rye fields were plowed under and planted to corn. Wet weather kept quite a number of the rye plants alive and they afforded suitable breeding places for chinch bugs. As a result, much of the corn planted in the turned-under rye fields is infested heavily.

Missouri. L. Haseman (July 22): Continued rains held back breeding and so reduced first-brood bugs that, except for occasional pastured fields of rye and wheat, bugs were too scarce at wheat harvest to cause any anxiety. Barriers were constructed in three or four northeastern counties.

Kansas. Although chinch bugs were found in the eastern part of the State, they were not numerous enough to warrant the construction of barriers.

#### CORN EAR WORM (*Heliothis obsoleta* Fab.)

Connecticut. N. Turner (July 22): Only one half-grown larva seen thus far in southern Connecticut. Less abundant than last year. Reported as present at Derby.

Maryland. E. M. Cory (July 24): The corn ear worm seems to be building up rapidly.

Virginia. H. G. Walker and L. D. Anderson (July 26): Moderately abundant on tomatoes and from moderately abundant to very abundant on field and sweet corn in the vicinity of Norfolk.

South Carolina. F. Sherman (July 18): Infestation in tomatoes has been above normal, but it is now decreasing as nearby corn silks become available.

Ohio. H. C. Mason (July 20): The tomato fruit worm is causing considerable injury to tomatoes at South Point, but is not as serious as in 1934.

E. W. Mendenhall (July 17): The tomato fruit worm is very injurious in southwestern Ohio, doing severe damage to tomatoes.

Illinois. W. P. Flint (July 24): No reports of damage from the corn ear worm have been received to date.

Iowa. C. J. Drake (July 29): The corn ear worm is fairly abundant in the southern half of the State. Considerable damage has been noted in Marshall and Story Counties.

Missouri. L. Haseman (July 22): The first generation has been showing up



in the tassel end of young corn and a few complaints have already been received where it is working in early sweet corn.

Arkansas. D. Isely (July 20): Injury by the corn ear worm is unusually light for the latter part of July.

Kansas. H. R. Bryson (July 27): The corn ear worm injured early sweet corn quite severely, although the injury did not appear quite so severe as in other years. A report of ragworm injury was received from Summerfield. Many local reports of injury to tomatoes. Reports of serious damage to tomato fruits were received from Marquette, Alma, and White Water.

Oklahoma. F. E. Whitehead (July 22): The corn ear worm is infesting approximately 100 percent of the sweet corn in the vicinity of Stillwater and is extremely common in other varieties.

Idaho. R. W. Haegele (July 22): The corn ear worm is very common this year in the southwestern part of the State. Sweet-corn ears are 50 percent infested and the larvae are feeding on the tassels of late-planted field corn. Many larvae are full grown and are leaving the corn.

Utah. G. F. Knowlton (July 22): Corn ear worms are now beginning to attack sweet corn at Logan. Worms are moderately abundant in tomato fruits in Utah County. The largest caterpillars are now one-third grown.

#### STALK BORER (Papaipema nebris nitela Guen.)

New York. C. R. Crosby (July 11): Specimens received from Massena, where they were attacking tomato plants.

Indiana. J. J. Davis (July 24): The stalk borer was reported damaging sweet corn at Campbellsburg on July 8. This is the only authentic report to date.

Kentucky. W. A. Price (July 29): The common stalk borer has been the cause of many complaints by flower and vegetable growers.

Kansas. H. R. Bryson (July 27): Common stalk borer reported doing some local injury to corn at Lebanon.

#### EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. N. Turner (July 22): Pupation is general. In early sweet corn on one farm from 60 to 75 percent of the ears were infested. The infestation in Hartford County does not seem quite as heavy as last year, although no figures are available. Damage has increased in the southwestern part of the State. Borers are more abundant in the northwestern section but are not causing much damage as yet.

New York. N. Y. State Coll. Agr. News Letter (July 15): The corn borer is working on the tassels of early sweet corn in Suffolk County, but

was not observed in destructive numbers on potatoes, as occurred last year around the Southold area. The borer is doing considerable damage in Nassau County.

Virginia. H. G. Walker and L. D. Anderson (July 26): About 80 percent of the larvae placed in an outside hibernation screen cage last fall at Onley, Accomac County, completed their development and emerged as adults this spring. Pupation began the latter part of April and several moths had emerged by May 8. On May 15 these moths began laying eggs which hatched on May 27. Larvae hatched on June 6 pupated on July 3, proving that the two-generation form is the one present here. The first moths of the second generation emerged in our breeding cages on July 10 and began laying eggs on July 13. Field observations indicated that the borer completed its life history as early or earlier in the field than in our cages.

#### SOUTHERN CORN STALK BORER (Diatraea crambidoides Grote)

Maryland. E. N. Cory (July 23): The southern corn stalk borer is attacking corn at Leonardtown.

Virginia. H. G. Walker and L. D. Anderson (July 26): The larger corn stalk borer is very abundant and many fields of corn around Norfolk are being injured.

Alabama. J. M. Robinson (July 20): The larger corn stalk borer is moderately abundant at Fairfax, Attalla, and Auburn.

#### LESSER CORN STALK BORER (Elasmopalpus lignosellus Zell.)

Maryland. E. N. Cory (July 24): Lesser corn stalk borer attacking corn at Westminster.

Alabama. J. M. Robinson (July 20): The lesser corn stalk borer was reported as attacking peanut vines in Houston County, as well as being moderately abundant on corn in the southeastern part of the State.

#### SOUTHERN CORN ROOT WORM (Diabrotica duodecimpunctata Fab.)

Ohio. T. H. Parks (July 25): Corn root worm larvae have been causing injury to corn in a field in Licking County. Some of the plants have fallen over as a result of the feeding.

Illinois. W. P. Flint (July 24): The southern corn root worm has caused an enormous amount of damage throughout the west-central counties of Illinois. Beetles were unusually abundant in the spring, and many fields of corn in that section are now virtually destroyed.

Kentucky. W. A. Price (July 29): The southern corn root worm has been more destructive to corn than usual.

Missouri. L. Haseman (July 28): The southern corn root worm has been doing much damage to corn during the past 2 or 3 weeks. The beetles have been injuring late-planted cucumbers and squashes in central Missouri.

#### CORN SILK BEETLES (Luperodes spp.)

Alabama. J. M. Robinson (July 20): The corn silk beetle L. davisi Leng was active on corn silks and cotton leaves in Covington and Geneva Counties.

Mississippi. C. Lyle (July 23): Specimens of L. varicornis Lec., reported as injuring young corn, were received from Pickett, in Rankin County, and inspector N. D. Peets states that serious injury has occurred in Lincoln County.

#### CLOVER AND ALFALFA

##### ALFALFA WEEVIL (Hypera postica Gyll.)

General. G. I. Reeves (July): In the course of our scouting operations in June, the alfalfa weevil was found in Sioux and Scotts Bluff Counties, Nebr.; Montezuma County, Colo.; Kane County, Utah; Clark County, Nev.; Coconino County, Ariz.; Malheur, Baker, and Union Counties, Oreg.; and in Mendocino County, Calif.

Utah. C. J. Sorenson (July 20): The alfalfa weevil is moderately abundant in Juab, Millard, Box Elder, and Cache Counties.

California. A. E. Michelbacher (July 22): Through the infested area of lowland in central California the larvae of the alfalfa weevil can be collected easily. On July 18 the numbers of larvae collected per 100 sweeps of an insect net ran as high as 75. Parasitization by Bathyplectes curculionis Thoms. has fallen off rather rapidly. At Pleasanton on July 10 about 10 percent and at Niles 13 percent of the large larvae were parasitized. No infested larvae of the alfalfa weevil were found in the San Joaquin Valley.

##### PLANT BUGS (Lygus elisus Van D.)

Utah. C. J. Sorenson (July 20): Lygus elisus Van D. and var. hesperius Knight are moderately abundant over the entire State, chiefly in alfalfa fields.

##### ALFALFA LOOPER (Autographa californica Speyer)

Wyoming. C. L. Corkins (July 9): We are now having considerable difficulty with the alfalfa semilooper in Park County. Following the cutting of alfalfa, these worms are migrating into bean fields, where damage in some instances has been severe before control measures could be started.



Oregon. D. C. Mote (July): Newly hatched larvae of the second generation are occurring in Willamette Valley. First-brood worms injured beans, corn, squash, and seedling alfalfa.

## FRUIT INSECTS

### APPLE

#### CODLING MOTH (Carpocapsa pomonella L.)

New York. P. J. Parrott (July 23): The codling moth is moderately abundant about Geneva, and is very abundant in Niagara, Orleans, and Monroe Counties.

N. Y. State Coll. Agr. News Letter (July 22): Codling moth injury is becoming more noticeable in the orchards in western New York.

Delaware. L. A. Stearns (July 23): There were two peaks of activity of spring-brood moths as indicated by bait pans--May 28-29 and June 17-18. First-brood attack was considerably lighter than usual. First first-brood moths appeared on July 8. No serious second-brood injury reported as yet.

Georgia. C. H. Alden (July 24): Injury to apples by first-brood worms is becoming more abundant at Cornelia and Thomaston but is not as heavy as in 1934. Broods are now overlapping, so that continuous fresh stings are being noted.

Ohio. T. H. Parks (July 25): Growers report less injury than usual from first-brood larvae. Well-sprayed orchards show very few codling moth blemishes. Bait pans are not catching many moths.

J. S. Houser (July 23): First adults of summer brood emerged at Wooster on July 23.

Indiana. L. F. Steiner (July 23): The effect of cool, rainy weather on the amount of injury by first-brood larvae is well illustrated at Richmond. In 1934 the first pick-up of drop fruit early in June averaged 600 successful entrances per tree and by harvest time trees that had had intensive spraying produced an average of 3,500 worms each. Despite a larger crop this season, fewer and less thorough spray applications than in 1934, and a lighter residue load, drop fruits are so scarce that no pick-up had been justified. Worm entrances are almost impossible to find, yet stings are fairly abundant. It is very evident that the vitality of first-brood larvae this season was much less, when they attempted entrance, than in 1934 and that considerably lighter deposits of poison were needed to effect the same degree of control.

D. W. Hamilton (July 21): At Orleans practically all adult activity of the spring brood had ceased by July 2. First-brood larvae

began pupating under bands between June 26 and July 3. Daily captures in light and bait traps began picking up the night of July 16, indicating that first-brood adults were emerging in the orchard.

Illinois. W. P. Flint (July 24): Codling moths continue to be scarce in most areas but there is a distinct increase in the infestation.

Michigan. R. Hutson (July 11): The first-brood codling moth has been very late and straggling in its appearance. Flight peaks occurred on June 22 in Berrien County; on July 1 at Hartford, in Van Buren County; and on July 2 at Mason, in Ingham County.

Wisconsin. C. L. Fluke (July 22): First brood very light at Madison; maximum flight of second brood not expected until the second or third week of August.

Missouri. L. Haseman (July 22): The unusual season spread the spring brood of moths in southern Missouri over a 2-month period and in central and northern Missouri emergence was delayed nearly 3 weeks. However, few of the early moths in southern Missouri succeeded in leaving offspring. As a result, second-brood moths all over the State are appearing uniformly in two bunches. The first bunch emerged between July 15 and 20 and the second and probably the larger bunch is expected between July 25 and early August. Generally speaking, spray control, combined with the weather, has been very effective against first-brood worms.

Arkansas. D. Isely (July 20): The codling moth infestation is later and lighter than it has been since 1928.

Oklahoma. F. E. Whitehead (July 22): The codling moth is present in about its usual numbers, taking a large toll of the apple crop.

Washington. E. J. Newcomer (July 25): Moths of the first brood began emerging at Yakima about July 12. This is 3 weeks later than in 1934. The infestation is lighter this year than last, owing to continued cool weather during May and June.

Oregon. D. C. Mote (July): First-brood moths are not out yet. Highest infestation for several years.

California. S. Lockwood (July 24): Pear growers in the Sacramento River area below the City of Sacramento are receiving more loss from the codling moth this year than for many years.

#### APPLE MAGGOT (Rhagoletis pomonella Walsh)

Connecticut. P. Garman (July 22): Flies emerging in fair numbers. Prospects of a heavy-to-moderate infestation.

New York. P. J. Chapman (July 22): The emergence of flies in the Hudson

Valley is later than in 1933 and 1934. Indications are that the peak of emergence had not been reached up to and including July 19, but should occur by July 24-26 in that area. During the past two seasons the peak has occurred approximately from July 15 to 17.

New Jersey. M. Kisliuk, Jr., and E. Kostal (July 8): The first adult was observed on an apple leaf at Morganville on July 2.

Michigan. R. Hutson (July 11): Adults were captured at Lawton and South Haven on July 7, and at Elk Rapids on July 9.

Wisconsin. C. L. Fluke (July 22): The first adult emerged at Gays Mills July 15, about 10 days later than the average date in previous years.

#### APPLE FLEA WEEVIL (Orchestes pallicornis Say)

Ohio. T. H. Parks (July 25): Many orchards have a great deal of flea weevil injury. Two orchards near Delaware now show very serious injury.

#### A SCARABAEID (Trichiotinus bibens Fab.)

North Carolina. C. H. Brannon (July): This species is causing considerable injury to apples in several mountain counties.

#### PEACH

#### PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Connecticut. P. Garman (July 22): The plum curculio is less abundant than usual.

Delaware. L. A. Stearns (July 23): Maximum emergence of first-brood adults July 8; about 25 percent of dissected females contain fully developed eggs; the usual partial second brood will probably develop in southern Delaware.

Virginia. W. J. Schoene (July 23): During the past few weeks adults have been found in unusual numbers in peach orchards in the Roanoke section. Some of the females were found to contain fully developed eggs.

Georgia. O. I. Snapp (July 20): The very dry weather at Fort Valley during the last month prevented the new beetles from depositing many eggs, and, as a result, the peach crop was harvested without much damage from second-brood larvae. An unusually heavy emergence of first-generation adults occurred this year and the peach crop would have encountered a serious second brood had the weather been normal. There is now an unusually large population of first-generation adults in peach orchards and, since these have not deposited many eggs this year, a heavy early infestation is predicted for 1936.



C. H. Alden (July): Some orchards at Thomaston showed infestations as high as 25 percent at harvest time, while others ran as low as 3 percent. Fruit has not yet been harvested at Cornelia but so far the infestation is running less than 5 percent in Georgia Belle peaches.

Mississippi. C. Lyle (July 23): Very severe damage to peaches ripening in July has been reported from practically all sections of Mississippi.

Missouri. L. Haseman (July 22): This pest was slow in showing up, but recently many plums and peaches have been showing nearly mature larvae.

#### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (July 22): The first generation is unusually scarce; second generation much delayed, and scarce in most orchards of the State.

Delaware. L. A. Stearns (July 23): Parasitization of first-brood twig-infesting larvae shows a decline approximating 30 percent from that of 1934. Second-brood twig-infesting larvae are now practically mature. Injury has increased, owing to lower parasitization, and considerable infestation of peaches and apples by later broods seems probable.

South Carolina. W. C. Nettles (July 18): The oriental fruit moth is below normal in destructiveness.

Georgia. C. H. Alden (July 22): The fruit moth has not been a factor this year at Cornelia and Thomaston. Fruit scored in central Georgia showed about 2 percent infestation, as compared with 18 percent in 1934.

Indiana. L. F. Steiner (July 23): More adults have been coming to codling moth traps during the past week than any previous week this season.

Illinois. W. P. Flint (July 24): The oriental fruit moth is more abundant than in any year for the last 3, and large numbers are now going into peaches.

Tennessee. G. M. Bentley (July 22): The third brood of the oriental fruit moth is making its appearance. The situation is generally bad over the State.

Mississippi. C. Lyle (July 23): Many complaints of the oriental peach moth have been received during the month. All plant board inspectors are reporting serious injury to peach twigs.

#### PEACH BORER (Aegeria exitiosa Say)

Virginia. W. F. Turner (July 19): The peach tree borer is extremely abundant and obviously injuring the trees at Crozet. Three full-grown borers were

found in one 6-inch section of root  $\frac{1}{2}$  inch thick, about 2 $\frac{1}{2}$  feet from the trunk. From 10 to 12 full-grown borers were found in many trees. One tree had 17 borers.

Georgia. O. I. Snapp (July 20): Pupation is beginning generally in commercial peach orchards around Fort Valley. Twenty-nine cocoons were taken during an examination of 100 trees on July 18.

Indiana. J. J. Davis (July 24): The peach tree borer was reported attacking peach at Mishawaka early in July.

#### PEACH TWIG BORER (Anarsia lineatella Zell.)

Utah. C. J. Sorenson (July 1): Specimens collected at Farmington in June.

California. H. C. Donohoe (July 1): Apricots picked in an orchard at Orland in which no control was practiced this spring were examined on June 24 while being cut for drying. Over 50 percent of the fruits were infested by the peach twig borer.

#### GREEN STINK BUG (Acrosternum hilaris Say)

California. S. Lockwood (July 24): In the last 3 weeks the southern half of the San Joaquin Valley has been overrun with plant bugs. These have for the most part been A. hilaris, followed by much smaller numbers of Chlorochroa saxi Stahl and by even fewer Thyanta custator Fab. Considerable damage has been done to canning peaches in some rather small areas. In one section between 40 and 50 acres of peaches have been absolutely ruined and the fruit will not be picked. Reports from other areas state that these insects are quite numerous in cotton fields, where they are causing the young squares to drop, and are also puncturing cotton leaves.

#### PLANT BUGS (Lygus spp.)

Connecticut. P. Garman (July 22): Some orchards severely damaged, particularly those with a light set of fruit; damage most severe in Glastonbury district, Hartford County.

#### PEAR

#### PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. P. Garman (July 22): Pear psylla abundance is the same as last month in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (July 22): The pear psylla is causing serious damage in some orchards in western New York.

CHERRYCHERRY FRUIT FLY (Rhagoletis cingulata Loew)

Michigan. R. Hutson (July 11): The white-banded cherry fruit fly appeared at Traverse City on July 2 and at Elk Rapids on July 9.

Oregon. D. C. Mote (July): R. cingulata emergence, June 3; oviposition, June 13; hatching, July 11, in the field.

CHERRY LEAF BEETLE (Galerucella cavicollis Lec.)

Maryland. E. N. Cory (July 24): The cherry leaf beetle has been reported from two counties, Garrett and Allegany. (Det. by H. S. Barber.)

West Virginia. F. W. Craig (August 1): Specimens were sent in from Huntington, in Cabell County, and from Pocahontas County.

PEAR SLUG (Eriocampoides limacina Retz.)

New York. C. R. Crosby (July 10): Specimens received from Lima, where they were attacking cherry.

N. Y. State Coll. Agr. News Letter (July): After several years' vacation, the pear slug is skeletonizing neglected cherry trees and is working some on pear in Monroe County. It was also noted on young unsprayed cherry trees in Niagara County.

Indiana. J. J. Davis (July 24): Cherry and pear slug reported as skeletonizing pear and cherry foliage at Tipton and Michigan City the last of June. The infestation is general, at least in the northern half of the State.

DEWBERRYBOXELDER BUG (Leptocoris trivittatus Say)

Utah. G. F. Knowlton (July 19): Boxelder bugs were found to be feeding on ripe dewberry fruits at Granger, Salt Lake County.

BLUEBERRYBLUEBERRY STEM BORER (Oberea myops Hald.)

North Carolina. C. H. Brannon (July 29): This species is attacking commercial plantings of blueberries in Pender County, causing serious damage to branches and twigs. (Det. by A. G. Boving.)



GRAPEGRAPE LEAFHOPPER (Erythroneura comes Say)

- Delaware. L. A. Stearns (July 23): Infestation subnormal; usual grape leafhopper spray in early July omitted in most vineyards.
- Michigan. R. Hutson (July 3): A peak in the hatching of the grape leafhopper occurred July 3 in the grape region about Paw Paw, Van Buren County.
- Idaho. R. W. Haegele (July 22): The grape leafhopper is injuring grapes in Canyon County.
- Utah. G. F. Knowlton (July 19): Grape leafhoppers have destroyed 90 percent of the foliage on Virginia creeper bushes at one place at Lake View, Utah County.

GRAPE ROOT WORM (Fidia viticida Walsh)

- Delaware. L. A. Stearns (July 1): Injury to grape reported and specimens received from Felton.

CURRENTCURRENT APHID (Myzus ribis L.)

- South Dakota. H. C. Severin (July 22): The current aphid is unusually abundant this year. This pest has actually been responsible for defoliating current bushes for the first time to my knowledge in South Dakota.

PECANPECAN BUDMOTH (Gretchena bolliana Sling.)

- Mississippi. C. Lyle (July 23): Injury due to the pecan budmoth from Hernando on June 28 and from New Albany on July 20 has been reported.
- Arkansas. P. H. Millar (July 13): I am enclosing a larva and a pupa taken from black walnut at Leachville yesterday. These were attacking the nuts principally at the points where two nuts touched each other. Both pupae and larvae were exposed by separating the nuts from each other. The larvae were apparently feeding on the green hulls of the nuts. (Det. as Gretchena sp., presumably bolliana. C. Heinrich.)

PECAN LEAF CASE BEARER (Acrobasis juglandis LeB.)

- Connecticut. E. P. Felt (July 24): The walnut case bearer (A. juglandis) was reported as very abundant at Orange.

North Carolina. R. W. Leiby (July 18): Rather severe damage was inflicted this spring to pecan buds and twigs by the leaf case bearer at Elizabeth City in the largest orchard in the State. The summer work of larvae on the foliage is now beginning to appear.

A SCARABAEID (Pachystethus marginata Fab.)

Mississippi. H. Gladney (July 23): These beetles were practically defoliating 5 acres of young pecan trees in Jackson County early in July. Such severe injury had not been noticed in previous years.

PECAN APHIDS (Monellia spp.)

Mississippi. J. P. Kislanko. (July 23): Pecan trees in lower Perry County were heavily infested with pecan aphids, M. costalis Fitch and M. nigropunctata Granovsky on July 17.

CITRUS

FRUIT FLIES (Anastrepha spp.)

Texas. N. O. Berry (July 26): Within the past 2 weeks 1,533 specimens were collected. Only 1 adult A. ludens Loew was taken in Matamoros, Mexico. Trapping of the other species of fruit flies ordinarily taken decidedly declined. There were 61 A. pallens Coq., 4 A. serpentina Wied., and 4 A. fraterculus auct. (not Wied.) taken on the American side of the Rio Grande. Peaches arriving in Matamoros were heavily infested with larvae identified as Anastrepha sp. (not ludens).

## TRUCK - CROP INSECTS

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

General. C. H. Hadley (July 30): The Asiatic garden beetle is unusually abundant and destructive in the suburban areas around New York City, New on Long Island and in New Jersey. In addition to feeding on such ornamental plants as asters, chrysanthemums, and dahlias, feeding injury has been heavy in vegetable gardens on beets, carrots, cabbage, peppers, and turnips.

CARROT BEETLE (Ligyrus gilbescens DeG.)

Indiana. J. J. Davis (July 24): Adult carrot beetles were reported from Goshen on June 26 and from La Porte on July 6. They were attacking the roots and underground stems of flower-garden plants, sunflower and marigold being specifically mentioned.

Michigan. R. Hutson (July 11): The carrot beetle has been sent in from Davidson, Flint, Nashville, Ann Arbor, Kalamazoo, Battle Creek, and Lansing.

Missouri. L. Haseman (July 22): This species has continued to appear in unusual numbers throughout most of July.

GARDEN WEBWORM (Loxostege similalis Guen.)

Ohio. B. J. Landis (July 20): The garden webworm was present on lambsquarters and corn on July 16.

Nebraska. M. H. Swenk (July 15): A Frontier County correspondent reported that the peas, beans, beets, and other garden truck was being destroyed by garden webworms.

Kansas. H. R. Bryson (July 27): The garden webworm was reported on July 18 as doing serious injury to leaves of corn near Wakarusa.

TARNISHED PLANT BUG (Lygus pratensis L.)

Indiana. J. J. Davis (July 24): The tarnished plant bug has been abundant since the last of June in northern Indiana, attacking celery and potato. According to G. E. Gould, weediness of fields and surroundings is largely, if not entirely, responsible for the heavy infestations.

Missouri. L. Haseman (July 22): The tarnished plant bug is unusually abundant at this time, attacking flowers and most crops.

Utah. G. F. Knowlton (June 23): Tarnished plant bugs are causing potato tops to wilt at Roy.

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Florida. J. R. Watson (July 22): The leaf-footed bug seems to be unusually abundant this year.



POTATO AND TOMATOCOLORADO POTATO BEETLE (*Leptinotarsa decemlineata* Say)

Ohio. B. J. Landis (July 20): First-generation adults were numerous, feeding and ovipositing on potato, spring groundcherry, matrimony vine, and tobacco.

Indiana. J. J. Davis (July 24): Adults had destroyed 30 acres of tomatoes at Vincennes by July 5, and were expected to do more damage, as the insecticides used had not given satisfactory control.

Wisconsin. E. L. Chambers (July): The Colorado potato beetle, until the past few years very abundant but scarcely reported last year as doing any serious injury, is again on the increase and requires much attention to prevent crop damage to potatoes and tomatoes in certain sections of the State.

Minnesota. A. G. Ruggles and C. E. Mickel (July 23): The Colorado potato beetle is moderately abundant.

North Dakota. J. A. Munro (July 15): The Colorado potato beetle is moderately abundant in Bottineau and Cass Counties.

South Dakota. H. C. Severin (July 22): The Colorado potato beetle has not been troublesome for years, but apparently is building up its numbers again. Injury is severe in spots.

TOMATO PINWORM (*Gnorimoschema lycopercicella* Busck)

Virginia. H. G. Walker and L. D. Anderson (July 26): Leaf-mining larvae were collected in tomato leaves growing in a greenhouse at Norfolk, and in tomato and potato leaves growing in a field nearby. (Det. by C. Heinrich.)

California. J. C. Elmore (July 18): At La Mesa one field was generally infested in both leaves and fruit. At El Cajon the main winter crop was just going in, but an early garden crop was found to be heavily infested, largely in the leaf-mining and folding condition. No infestations were found at Chula Vista. Severe commercial damage was reported on this date in 1934 in all of the tomato-growing districts mentioned above. In Peter's Canyon the pinworm is common on the foliage of tomatoes but no injury to the fruit was observed. Less damage than last year is indicated.

TOMATO WORMS (*Phlegethontius* spp.)

New York. N. Y. State Coll. Agr. News Letter (July): Tomato worms have made their appearance in Suffolk County.

Virginia. H. G. Walker and L. D. Anderson (July 26): The tomato hornworm has been very abundant in many tomato fields on the Eastern Shore of Virginia, the damage ranging from practically no injury in some fields to almost complete destruction of the crop in others.

Ohio. B. J. Landis (July 14): Eggs and young larvae of the tomato hornworm have appeared on tomato, jimson, and tobacco.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Connecticut. N. Turner (July 22): Tipburn appeared on potatoes on July 15 as a result of leafhopper attacks.

Iowa. H. E. Jaques (July 22): The potato leafhopper is very abundant in many regions.

POTATO APHID (Illinoia solanifolii Ashm.)

New York. N. Y. State Coll. Agr. News Letter (July): Potato aphids have occurred in heavy infestations in several parts of Nassau County.

GREEN PEACH APHID (Myzus persicae Sulz.)

Nebraska. M. H. Swenk (June 30): The green peach aphid has reached outbreak abundance on tomato and potato plants in the area from Lancaster, Sarpy, and Burt Counties west to Wayne, Knox, Antelope, and Custer Counties.

BEANS

MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

New Hampshire. L. C. Glover (July 24): The Mexican bean beetle is very abundant throughout the infested area in the State this year. The pupae of the first generation were noted at Durham on July 21.

Connecticut. N. Turner (July 22): Although later than usual, the bean beetle has defoliated garden beans in many sections of the State. More abundant on lima beans than usual.

New York. M. Kisliuk, Jr., and E. Kostal (July 8): A few adults were noted on bean plants at Jamaica, L. I., on June 15.

Delaware. L. A. Stearns (July 23): Infestations severe where control measures have been omitted.

Maryland. E. N. Cory (July 24): The second brood is expected to be especially abundant.

Virginia. W. J. Schoene (July 23): The Mexican bean beetle has attracted more attention this season than for several years. The injury is spotted, but beans in many sections of the State have been severely injured.

Ohio. T. H. Parks (July 25): The Mexican bean beetle is very destructive this year.

N. F. Howard (July 23): The Mexican bean beetle is more abundant in central Ohio than ever before, and garden beans have been destroyed or

seriously damaged in many instances. For the first time in history the beetle has caused injury at Marion, where the abundance is not limited to city gardens but is also prevalent in farm gardens considerably removed from the city. H. C. Mason reports that at South Point all early beans not treated were defoliated.

Indiana. J. J. Davis (July 24): The Mexican bean beetle has been unusually abundant this year, reports of abundance and destruction coming in every day since July from all parts of the State. Damage is reported for the first time from Lake County in the extreme northwest corner of the State.

Iowa. C. J. Drake (July 29): An infestation of the Mexican bean beetle has been discovered near the central part of the State at Newton, Jasper County (Det. by E. A. Chapin.)

Tennessee. G. M. Bentley (July 22): The Mexican bean beetle is generally very injurious over the State where treatments are not used.

J. Milan (July 19): The Mexican bean beetle is causing considerably more loss at Clarksville this season than for several years, even with the use of better and more effective insecticides.

Alabama. J. M. Robinson (July 20): The beetle continues to be very abundant over the infested part of Alabama. The eggs have continued to hatch through July owing to rains and cloudy weather.

Mississippi. C. Lyle (July 23): Numerous complaints have been received during July, although the beetle is apparently not attracting as much attention as in June.

Utah. G. F. Knowlton (July 30): The Mexican bean beetle is seriously damaging bean foliage at Moab and Castle Valley, in the southern part of Grand County.

#### WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon. D. C. Mote (July): The western spotted cucumber beetle is more abundant on cucurbits in Willamette Valley than for several years. Indications are that canning beans will be injured.

#### A SCARABAEID (Strigoderma arboricola Fab.)

Maryland. E. M. Cory (July 24): This scarabaeid has been taken in a number of bean fields on the Eastern Shore.

A. W. Palmer (July 3): The beetles were collected at Cove Point, on the bay shore about 5 or 6 miles north of Solomon's Island. They were feeding voraciously on roses, coreopsis, hollyhock, and Japanese Iris.

#### POTATO LEAFHOPPER (Empoasca fabae Harr.)

Ohio. N. F. Howard (July 23): The potato leafhopper was doing considerable



damage to beans at South Point and is more abundant than at any time since we have been making observations there.

B. J. Landis (July 20): On July 1 the potato leafhopper was breeding in broad beans and doing considerable damage at Columbus.

#### A PENTATOMID (Euschistus servus Say)

Virginia. W. H. White (July 31): On July 26 we received from Burke, near Fairfax, specimens of lima beans injured by the feeding of a pentatomid and by a disease. The correspondent said that the damage was confined to the pods and that the leaves were not affected. H. G. Barber determined the insect as E. servus, and L. L. Harter, of the Bureau of Plant Industry, determined the disease as pod blight caused by Diaporthe phaseolorum. It is apparent that the damage to the pods by the pentatomids was closely associated with the prevalence of the fungus, but it is impossible to state definitely whether the severe reduction of the crop was due solely to the activities of the insect or to a combination of insect and fungus injury.

#### PEAS

##### PEA APHID (Illinoia pisi Kalt.)

New York. F. J. Parrott (July 23): The pea aphid was very abundant in western New York during the early part of July.

Wisconsin. E. L. Chambers (July): The pea aphid has been unusually abundant and has done serious damage in many pea-growing sections of the State, but has now practically disappeared, leaving both the early and late crops greatly reduced in value.

Oregon. D. C. Mote (July): Pea aphids increasing in abundance at Scappoose, noticeably on peas.

#### CABBAGE

##### IMPORTED CABBAGE WORM (Ascia rapae L.)

Ohio. T. H. Parks (July 25): The cabbage worm is more abundant than usual on cabbage near Cleveland.

N. F. Howard (July 23): The cabbage worm is becoming very abundant in Sandusky County and growers are sufficiently alarmed to inquire about control measures. This is quite the reverse of the situation a few weeks ago.

B. J. Landis (July 20): Extremely numerous at Columbus on kale, broccoli, collards, rape, and cabbage.

Indiana. J. J. Davis (July 24): The cabbage worm has been unusually abundant in many sections of the State.

Minnesota. A. G. Ruggles and C. E. Mickel (July 23): The imported cabbage worm is very abundant.

Missouri. L. Haseman (July 22): During the first part of July cabbage worms were very abundant but lately have been less so.

Kansas. H. R. Bryson (July 27): Imported cabbage worms very abundant and destructive at Manhattan, Moundridge, Blaine, and Melvern.

Utah. G. F. Knowlton (July 19): Cabbage worms are damaging cabbage wherever observed in northern Utah.

#### CABBAGE LOOPER (Autographa brassicae Riley)

South Dakota. H. C. Severin (July 22): The cabbage looper has become exceedingly abundant and is doing much damage in gardens.

Ohio. T. H. Parks (July 25): This caterpillar is seriously abundant on cabbage at Columbus.

#### CABBAGE MAGGOT (Hylemyia brassicae Bouche)

Indiana. J. J. Davis (July 24): The cabbage maggot was reported to be damaging cabbage at Bourbon on July 16.

#### CABBAGE APHID (Brevicoryne brassicae L.)

South Dakota. H. C. Severin (July): The cabbage aphid is more abundant than usual, attacking red cabbage especially.

Nebraska. M. H. Swenk (June 15 to 30): The cabbage aphid was abundant and destructive to cabbage and radish from June 19 to 24, especially in northeastern Nebraska from Cass and Dodge Counties northwest to Knox and Antelope Counties.

Utah. G. F. Knowlton (July 10): Cabbage aphids have killed 10 percent of the cabbage plants in one field, and the remainder are seriously injured.

#### MELONS

##### PICKLE WORMS (Diaphania spp.)

Florida. J. R. Watson (July 22): Complaints were received from Lake County that D. nitidalis Stoll and D. hyalinata L. attacked watermelons, doing appreciable damage.

Mississippi. C. Lyle (July 23): General complaints of pickle worms have been received. A very heavy infestation in a field of cantaloups at Stat College was observed yesterday.

STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

- Connecticut. N. Turner (July 22): Late in June cucumber beetles were very abundant in many fields of squash. One grower reported more trouble than usual.
- New York. P. J. Parrott (July 23): Striped cucumber beetles are numerous.
- Ohio. B. J. Landis (July 20): Larvae of the striped cucumber beetle continued to cause noticeable damage to squash.
- Indiana. J. J. Davis (July 24): Striped cucumber beetle has been very abundant everywhere and especially difficult to control because of the excessive rains.
- Minnesota. A. G. Ruggles and C. E. Mickel (July 23): The striped cucumber beetle is very abundant.
- South Dakota. H. C. Severin (July 22): The damage to cucurbits from the striped cucumber beetle is slightly above average, generally.
- Nebraska. M. H. Swenk (July 1 to 15): The striped cucumber beetle was frequently reported, especially from the northeastern part of the State.
- Kansas. H. R. Bryson (July 27): Striped cucumber beetles are very abundant and are causing considerable damage to late squashes and melons. Early planted cucumbers at Manhattan escaped serious injury.

MELON APHID (Aphis gossypii Glov.)

- Indiana. J. J. Davis (July 24): The melon aphid was very abundant and destructive to melons and cucumbers in every section of Indiana during the past month.
- Kansas. H. R. Bryson (July 27): Melon aphids reported abundant at Sylvia and Manhattan on July 25.

SQUASH

SQUASH BUG (Anasa tristis DeG.)

- Ohio. B. J. Landis (July 20): Adults and eggs are moderately abundant at Columbus.
- Nebraska. M. H. Swenk (July 15): The squash bug was first reported injuring pumpkin and squash vines in Buffalo County on June 26. It has given much trouble, especially in the area from Boone, Howard, and Hamilton Counties west to Lincoln County.
- Oklahoma. F. E. Whitehead (July 22): Large numbers of squash bugs are present this summer and are doing considerable injury to squash.



Idaho. R. W. Haegele (July 22): Squash vines in the southwestern part of the State are generally infested.

Utah. G. F. Knowlton (July 22): Causing serious injury to squash plants in northern Utah.

### CELERY

#### CARROT RUST FLY (Psila rosae Fab.)

New York. N. Y. State Coll. Agr. News Letter (July 9): The carrot rust fly worm is causing serious stunting to celery in early celery fields for the first time in history, according to growers.

### ONIONS

#### ONION MAGGOT (Hylemyia antiqua Meig.)

New York. N. Y. State Coll. Agr. News Letter (July 22): Onion maggots are still causing considerable injury and losses.

Utah. G. F. Knowlton (July 10): Onion maggots are destroying approximately 10 percent of the seed onions in one patch at Logan.

### SWEETPOTATO

#### SWEETPOTATO SAWFLY (Sterictiphora cellularis Say)

Delaware. L. A. Stearns (July 23): Severe, although localized, infestations in areas about Laurel and Seaford. Adults, eggs, and larvae present on July 5. Now in pupal stage.

### STRAWBERRY

#### STRAWBERRY LEAF ROLLER (Ancylis comptans Froel.)

Ohio. E. W. Mendenhall (July 24): The strawberry leaf roller is very injurious on some plantations in Clark County.

Nebraska. M. H. Swenk (June 15 to 30): A complaint of injury to young strawberry plants was received on June 20 from Madison County.

Kansas. H. R. Bryson (July 27): Has been causing serious damage in a 3-acre strawberry patch near Valley Center.

Utah. G. F. Knowlton (July 19): Adults of the first generation are becoming abundant in some strawberry patches at Brigham, Providence, and Roy.

#### STRAWBERRY WEEVILS (Brachyrhinus spp.)

Idaho. R. W. Haegele (July 22): Infestation of strawberry root weevil found in strawberry fields in Adams County.

Utah. G. F. Knowlton (June 29): Strawberry weevils emerging in one strawberry patch at Logan are 10 percent B. ovatus L. and 90 percent B. rugosotriatus Goeze. The relative numbers of the two species vary greatly, but both are present in most patches.

### PEPPER

#### PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (July 22): The pepper weevil is destroying all buds as rapidly as they are formed in the infested area in Manatee County. Abandoned fields are being destroyed by the growers.

California. J. C. Elmore (July 18): One light infestation of pepper weevil found at Santa Ana, Orange County. Other fields near Balsa, Talbert, and Huntington Beach were not infested.

### BEETS

#### BEEF LEAFHOPPER (Eutettix tenellus Rak.)

Colorado. W. A. Shands and O. A. Hills (July): At the end of June the beet leafhopper populations were very high in the Grand Valley and Delta-Montrose districts. Evidence of the curly-top disease began to appear early in June and by the last of June the percentage of plants affected ranged from 30 to 50 percent, although in general the injury was not serious.

Idaho. R. W. Haegele (July 22): The tomato plantings of southwestern Idaho have been almost entirely killed out by the blight caused by the beet leafhopper.

Utah. G. F. Knowlton (July 3): Curly top is becoming increasingly severe in the Weber-Davis area. Some fields at Hooper are more than 60 percent affected. Tomato fields have been plowed up at Kaysville and Layton. (July 11): Curly top continues to increase in abundance. Already serious losses of tomato plants have been sustained in many localities, with counts showing as high as 80 percent diseased. Injury to sugar beets is gradually increasing in many parts of northern Utah. (July 22): Curly top is taking from 15 to 20 percent of the beets in some patches at Tremonton, Garland, and Salem.

#### A FALSE CHINCH BUG (Lygius sp.)

California. J. C. Elmore (July 18): A false chinch bug was very numerous in two sugar beet fields near Huntington Beach. Severe leaf damage was noted on about 10 percent of the plants. Has not been observed before in Orange County.

TOBACCOTOBACCO FLEA BEETLE (Epitrix parvula Fab.)

Tennessee. J. U. Gilmore (July 19): The first generation of flea beetles is now emerging and is causing considerable damage to half-grown tobacco at Clarksville. Infestations in many fields range from 15 to 20 beetles per plant.

A TOBACCO WORM (Phlegethontius sp.)

Tennessee. J. U. Gilmore and Joe Milam (July 19): The usual overwintering emergence of hornworm moths necessitated late June or early July dusting at Clarksville. The lack of rainfall in July has prevented the annual heavy emergence, which normally produces the heavy August deposition of eggs. At present larvae of all sizes are very scarce.

## C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

North Carolina. C. H. Brannon (July 29): July has been a month of frequent rains after the driest June in 42 years. As a result, the weevil infestation has increased rapidly in many sections. The infestation is still spotted, some sections having almost no infestation.

South Carolina. W. C. Nettles (July 13): The average infestation of cotton boll weevil over the State is a fraction over 10 percent on unpoisoned cotton.

Alabama. J. M. Robinson (July 20): The boll weevil has been active in southern and central Alabama during June and July. The first-generation adults have been active at Auburn for a week. The infestation has advanced from 10 to 15 percent. The boll weevil is also active in the northern part, but the percentage of infestation is not yet high enough to warrant dusting.

Mississippi. State Plant Bd. Weekly Cotton Insect Rpt. (July 29): Due to the decrease of squares in some sections and the increase of weevils generally, the infestation almost doubled during the past week, according to records made by inspectors on 84 farms in 17 counties. Clay Lyle, entomologist of the board, reports that an average infestation of 30 percent was found on the 82 infested farms, as compared with 16 percent last week and 37 percent on this date last year. Showers in the Delta were favorable for weevil increase.

Arkansas. D. Isely (July 20): The cotton boll weevil is more abundant than usual at this time of the year.

Oklahoma. C. F. Stiles (July 20): Boll weevil infestation is gaining slightly throughout the southeastern part of the State. The average infestation on the 17 fields examined during the week ending July 20 was 18.33 percent.



Texas. R. W. Harned (July 30): In Calhoun County damage from boll weevils is diminishing, owing chiefly to the arsenicals that have been applied to the cotton for leaf worm control.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Mississippi. State Plant Bd. Weekly Cotton Insect Rpt. (July 22): The first cotton leaf worm was found on July 11 in Washington County. This worm became an adult moth on July 20. (July 29): Leaf worms were reported from two farms in George County, and as they were almost grown, other infestations are expected at any time.

Arkansas. D. Isely (July 18): A light and scattered infestation of the cotton leaf worm was observed in Crawford County, the northwestern cotton-growing county in Arkansas. The larvae were in all stages and one pupa was also collected.

Texas. R. W. Harned (July 30): Every acre of cotton in Calhoun County has been successfully dusted or sprayed for leaf worm control. Many farmers believe the infestation this year has been heavier than in any previous year in their experience. In other counties in this section of Texas many cotton fields have been entirely stripped of foliage and the worms are eating the squares and stems.

CUTWORMS (Noctuidae)

Texas. A. J. Chapman, L. C. Fife, and H. S. Cavitt (July): Cutworms completely destroyed 26 acres of young cotton on a farm 5 miles west of Presidio. Larvae collected on May 23 were determined by C. Heinrich as "Feltia sp., possibly malefida Guen. lacking characteristic markings." Moths that emerged on June 18 were determined by F. H. Benjamin as F. malefida. These cutworms cut off the roots of young cotton plants just under the surface of the soil. No leaf injury was observed. Two species of dipterous parasites reared from this cutworm were identified by H. J. Reinhard, of the Texas Agricultural Experiment Station, as Bonnetia comta Fallen and Gonia longipulvilli Tothill.

Egypt. A. H. Rosenfeld (June 29): Cotton circles are at present very much upset by an unusually early and heavy attack of the cotton worm Prodenia sp., but, after last year's experience, I think the second-generation eggs have been pretty well eliminated from cotton by hand picking. The Ministry of Agriculture inspectors are offering about 15 cents per pound for cocoons collected from the berseem (Alexandria clover) fields, where the early generations mostly breed. The attack, as usual, is largely confined to the Delta.

PINK BOLL WORM (Pectinophora gossypiella Saund.)

Texas. G. G. Harris (June 30): The first worms were found in the field at Castolon on June 17, whereas last year the first field worms were not found until August 4. In the Presidio district the first field worm was found on June 20. The trap-plot cotton in the Castolon and Presidio districts of the Big Bend of Texas has been blooming profusely during June. Because of cool weather retarding the plants in the early spring a much smaller number of

blooms has been produced this year than last; however, the number of worms collected has been larger. During the month 121,449 blooms were produced and 11,061 pink boll worms found, while for the same month last year 227,566 blooms and 3,503 pink boll worms were found. The infestation in the plots increased rapidly, with the peak of infestation being reached for the week ending June 20, after which it dropped about as rapidly as it had increased.

Bahama Islands. R. E. McDonald (June 24): V. Curtis and L. F. Curl made a survey of the Bahama Islands from June 11 to 22 for the purpose of locating infestations of the pink boll worm on wild or cultivated cotton. Only part of the Islands were visited and infestations were found on only two. The percentages of infestation of the bolls examined at various points are as follows: Berry Island--Little Harbor Key, 19; Holmes Key, 37.68; Frazier Hog Key, 62.35; New Providence Island--Delaport Point, 83; Wolf Road, Nassau, 66.66; Grand Bahama Island, 0; Grand Keys, 0; Great Sale Key, 0; Great Abaco, 0; Mores Island, 0.

#### COTTON APHID (Aphis gossypii Glov.)

North Carolina. C. H. Brannon (July): Heavy infestation on cotton reported from Hyde County.

South Carolina. W. C. Nettles (July 18): Leaf aphid on cotton above normal in the State.

Mississippi. C. Lyle (July 23): A complaint of severe damage by the cotton aphid was received from Webster County on July 15 and inspector N. D. Peets reports serious injury in many fields in Copiah and Lincoln Counties. It is also reported in Rankin and George Counties.

Texas. R. W. Harned (July 30): The cotton aphid has increased and, with continued applications of calcium arsenate killing its enemies, may be injurious in the near future.

#### COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. J. G. Watts (July 18): Less abundant than last year.

Mississippi. State Plant Bd. Weekly Cotton Insect Rpt. (July 8): Some complaints of flea hopper damage have been reported from Marshall, Tate, and Washington Counties, but there is little indication of a general infestation.

Arkansas. D. Isely (July 20): Injury by the cotton flea hopper attacking cotton has continued later than usual.

#### TARNISHED PLANT BUG (Lygus pratensis L.)

Arkansas. D. Isely (July 20): Injury by the tarnished plant bug attacking cotton has continued later than usual.



### GRAPE COLASPIS (Colaspis brunnea Fab.)

Mississippi. C. Lyle and assistants (July 23): The grape colaspis is reported to be unusually abundant on cotton in the Delta. A correspondent at Hattiesburg sent in specimens with the complaint that they were damaging vegetables.

### COMMON RED SPIDER (Tetranychus telarius L.)

North Carolina. C. H. Brannon (July 29): Red spiders on cotton are evident in many fields but the infestation is exceedingly light.

South Carolina. W. C. Nettles (July 18): Red spiders on cotton more widely prevalent than usual.

Mississippi. State Plant Bd. Weekly Cotton Insect Rpt. (July 29): Red spiders were reported causing some damage to cotton in Washington, Bolivar, and Sunflower Counties.

## FOREST AND SHADE - TREE INSECTS

### OBLONG LEAF WEEVIL (Phyllobius oblongus L.)

New York. R. E. Horsey (July 22): I was much interested in the report of this insect in Ohio, noted in the last number of the Insect Pest Survey Bulletin. I was present at the discovery of this insect at Rochester in 1923. It was a very local infestation and did little damage, although the weevils were quite numerous on a couple of elms. Through a careful spraying at once in 1923, apparently all the weevils were destroyed. I have not seen or heard of one since. A visit to these trees on July 21, 1935, shows them to be in good health with no weevils present.

### FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Maine. H. B. Peirson (July): Reported in Limerick, Cornish, Hiram, Baldwin, and many other areas, especially near Lincoln and Jonesport. Heavy infestations occur, defoliating thousands of acres of poplar and birch.

Vermont. J. V. Schaffner, Jr. (July 24): The owners of sugar-maple orchards in Bennington, Windsor, and Rutland Counties are very much concerned over the severe defoliation of the trees by the forest tent caterpillar. In Windham County several natural forest areas are severely infested. Collections of cocoons from four defoliated sugar-maple orchards, where the insect apparently has reached its peak, have given an average issuance of moths of only 9 percent and an average parasitization to date of 37 percent. In an area not completely defoliated, where the infestation possibly has not reached its peak, a collection of cocoons taken from the foliage of trees has produced a moth issuance of 45 percent and parasitization only 5½ percent.



New Hampshire. L. C. Glover (July 3): The forest tent caterpillar was very abundant in localized areas and apparently has increased generally throughout the State.

Connecticut. W. E. Britton (July 23): Common in the northwestern portion of the State, where it is feeding on maple and other deciduous trees.

Minnesota. A. G. Ruggles and C. E. Mickel (July 23): The forest tent caterpillar stripped leaves of poplar and birch over thousands of acres in northeastern Minnesota. It is a menace to the tourist trade. Also bad in Otter Tail County.

#### SATIN MOTH (Stilpnotia salicis L.)

Maine. H. B. Peirson (July): The satin moth was abundant on willows and poplar in June at South Portland and Harrison.

Massachusetts. J. V. Schaffner, Jr. (July 24): Egg deposition is reported as heavy in some localities, especially in the region of the original infestation at Medford and Malden.

Oregon. C. A. Cole (July 23): We have completed a satin moth survey and find the following counties infested: Benton, Clackamas, Linn, Marion, Multnomah, Polk, Washington, and Yamhill. With the exception of two clumps of Silver poplars located in the vicinity of Gervais, Marion County, no damage is being done. Larvae were found on Silver, Carolina, and Lombardy poplars. They seemed to prefer the Silver poplar.

#### CANKER WORM (Geometridae)

North Carolina. R. A. St. George and B. H. Wilford (June 9): On June 9 came across a 2-acre area of black oaks not far from Asheville which were being severely defoliated by the fall canker worm (Alsophila pometaria Harr.). The caterpillars were hanging by threads from many of the trees, which were completely stripped of foliage, and were also abundant on the ground along the highway. The trees in adjacent areas were only lightly attacked. Calosoma beetles were active on the heavily infested area. (C. Heinrich, who identified the material, stated that the outbreak is a more southern one than heretofore known.)

Ohio. E. W. Mendenhall (July 16): The spring canker worm (Paleacrita vernata Peck) is very plentiful on apple in western and northwestern Ohio.

Utah. G. F. Knowlton (June 7): Caterpillars are seriously damaging the foliage of boxelder, alder, and oak at Mill Creek.

Connecticut. W. E. Britton (July 23): Larvae of Ennomos subsignarius Hbn. were found feeding with canker worms in the northwestern part of the State. Swarms of the white moths were noticed around electric lights in Bridgeport, New Haven, and Waterbury the first week of July.

LIME-TREE LOOPER (Erannis tiliaria Harr.)

New York. L. O. Howard (July 22): Larvae were excessively abundant at Tannersville in June, hanging suspended by their threads and getting on everyone's clothes, just as the spring canker worms did in Ithaca when I was a boy.

GYPSY MOTH (Porthetria dispar L.)

New England. L. H. Worthley (July 29): According to observations by district inspectors during the larval period of the gypsy moth, there has been a heavy increase in infestation in the lumber-shipping districts of western Maine, central and northern New Hampshire, and central Massachusetts. A large amount of cut lumber piled in these sections will be exposed to the danger of becoming infested with gypsy moth egg clusters. At present gypsy moth larvae, pupae, adult moths, and egg clusters are to be found in the field. The first new gypsy moth egg clusters were noticed in Providence, R. I., on July 19; in Holyoke, Mass., on July 15; and in Chesterfield, N. H., on July 20.

New Hampshire. J. V. Schaffner, Jr. (July 24): In Hillsboro, Merrimack, and Rockingham Counties many woodland areas, totaling thousands of acres, are defoliated by the gypsy moth. Severe defoliation noted as far north as Andover in Merrimack County.

Massachusetts. J. V. Schaffner, Jr. (July 24): Extensive areas, involving several thousand acres of woodland, consisting principally of such favored foodplants as oak, gray birch, and poplar, were defoliated in the northern half of Worcester County, and in the eastern parts of Franklin and Hampshire Counties, east of the Connecticut River. This is the most extensive area ever defoliated in that part of the State. Several large areas of woodland in Barnstable County on Cape Cod were defoliated. With the exception of a few towns on Cape Cod the infestation in the eastern part of the State is very much reduced.

FALL WEBWORM (Hyphantria cunea Drury)

New York. N. Y. State Coll. Agr. News Letter (July 1): Fall webworms are showing up in Dutchess County.

Tennessee. G. M. Bentley (July 22): Generally bad over the State, attacking various shade and fruit trees.

Mississippi. C. Lyle (July 23): The fall webworm infestation is rather general over most of the State. The heaviest damage is occurring in the southern half.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Connecticut. W. E. Britton (July 23): Street trees in one block in New Haven infested. Some trees defoliated, others partially defoliated. It is unusual for this insect to damage trees in Connecticut. All have now been sprayed.



Maryland. E. H. Cory (July 24): Bagworms exceedingly numerous.

Virginia. H. G. Walker and L. D. Anderson (July 26): Bagworms are moderately abundant around Norfolk.

South Carolina. F. Sherman (July 18): Reports indicate it to be above average in abundance.

Ohio. T. H. Parks (July 25): Bagworm more serious than usual on arborvitae. Larvae now about half grown.

Indiana. J. J. Davis (July 24): The bagworm has been quite general and destructive to arborvitae, hard maple, boxelder, and persimmon in many parts of the State from Lafayette south. At Lafayette the first hatched larvae were observed on July 12, when they were about a week old.

Illinois. W. P. Flint (July 24): Bagworms are much more abundant than usual in the central Illinois area.

Alabama. J. M. Robinson (July 20): Bagworms are continuing to attract attention in widely separated places in Alabama.

Mississippi. C. Lyle (July 23): The bagworm is undoubtedly causing the most severe damage in many years. Numerous complaints were received during June and hardly a day has passed in July without receiving specimens.

#### BOXELDER

##### BOXELDER APHID (Periohyllus negundinis Thos.)

Nebraska. M. H. Swenk (June 30): The boxelder aphid was reported infesting boxelder trees in Cheyenne County on June 24.

##### COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Indiana. J. J. Davis (July 24): Cotton maple scale was reported as very abundant on maples at Elwood on July 20, the first report of abundance we have had for several years.

South Dakota. H. C. Severin (July): The cottony maple scale is very abundant on boxelder in De Smet.

#### CATALPA

##### CATALPA SPHINX (Ceratonia catalpae Bdv.)

Virginia. H. G. Walker and L. D. Anderson (July 26): The catalpa sphinx is defoliating many catalpas in the Norfolk area.



Ohio. E. W. Mendenhall (July 17): Larvae are quite injurious to Catalpa bungei and have defoliated many trees in southwestern Ohio.

Kentucky. W. A. Price (July 29): The catalpa sphinx has been very abundant in all sections of the State.

### ELM

#### ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Massachusetts. J. V. Schaffner, Jr. (July 24): Severe browning of elm foliage has been noted in Arlington, Belmont, Newton, Weymouth, and Woburn. Some feeding was noted at Middleboro and North Attleboro.

Connecticut. W. E. Britton (July 23): This insect is prevalent in some localities and scarce in others.

Maryland. E. N. Cory (July 24): The imported elm leaf beetle has done considerable damage in several sections of the State.

North Carolina. R. W. Leiby (July 19): Chinese elm trees, as well as American elms, have been rather severely damaged in the eastern and central parts of the State.

Ohio. T. H. Parks (July 25): The elm leaf beetle is rapidly defoliating some elms in the south end of Columbus. Other complaints come from Springfield and Lebanon. Much spraying has been done in Columbus.

M. F. Howard (July 23): The first generation is pupating and a few new adults are about. Injury to trees in the north side of Columbus is apparent and more spraying of elms has been done than usual.

E. W. Mendenhall (July 17 and 18): The elm leaf beetle is very injurious to elms in Cincinnati.

Idaho. R. W. Haegeler (July 22): Since my report of June 19, injury to elms has become very severe, practically all elms not sprayed being rapidly defoliated.

J. R. Douglass (July 13): While in Weiser yesterday I noticed elm trees badly defoliated.

Oregon. D. C. Mote (July): After 2 years of light infestation, this beetle is appearing in numbers and is causing damage at Corvallis.

Washington. E. J. Newcomer (July 25): This beetle has been in Yakima for several years, and has been gradually spreading. It is causing a great deal more damage than before and a concerted program of spraying will evidently have to be started next season.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiope L.)

Maine. H. B. Peirson (July): The spiny elm caterpillar was feeding on elm at South Portland on June 15.

New Hampshire. L. C. Glover (July 3): A local outbreak of the spiny elm caterpillar has been reported in Ashland.

OBLIQUE-BANDED LEAF ROLLER (Cacoecia rosaceana Harr.)

Nebraska. M. H. Swenk (July 1 to 15): During the first week in July the oblique-banded leaf roller was quite destructive to the foliage and fruit of the chokecherry and also to elm leaves in Box Butte County.

## APHIDS (Aphidae)

Iowa. C. W. Ainslie (July 31): Notwithstanding the heat and drought during the summer of 1934, various species of aphids multiplied and became a nuisance. Cars parked under elm trees in Sioux City were covered with honeydew. All sorts of herbs suffered. Before the end of the summer coccinellids multiplied and cleaned up most of the aphids. This spring the cold wet weather gave the aphids another chance to multiply and they appeared in devastating numbers. But it seems that the coccinellids had hibernated in unusual numbers and both they and the chrysopids have been busy so that now it is almost impossible to find an aphid anywhere in this region.

ELM COCKSCOMB GALL (Colopha ulmicola Fitch)

Delaware. L. A. Stearns (June 26): Injury reported and specimens received from Harrington.

Maryland. E. H. Cory (July 24): Cockscomb gall has been quite abundant on elms.

Ohio. T. H. Parks (July 25): Cockscomb gall on elms has been much more abundant this year.

Nebraska. M. H. Swenk (June 15 to 30): Reported injuring Chinese elm trees in Scotts Bluff County on June 27.

A LACEBUG (Corythucha pallida ulmi Osborn & Drake)

Connecticut. P. Wallace (July 23): Several street trees in Sharon had the foliage browned.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. R. E. Horsey (July 22): Several elms more or less infested were seen during the month at Rochester. The scale is apparently more numerous this year, although no damage to the trees was noticed.

Ohio. J. S. Houser (July 23): Numerous specimens of this insect have been received during the past month from many sections of Ohio. The insect is much more abundant than at any previous time.

T. H. Parks (July 25): More than the usual number of complaints of damage to elms has been received. This insect was hatching at Columbus during the middle of June.

Indiana. J. J. Davis (July 24): European elm scale has been reported from a number of localities in northern Indiana. Apparently this scale has become a serious problem in some cities.

Wisconsin. E. L. Chambers (July): The European elm scale has been found in several new localities this summer and elm trees over large areas of these villages were found heavily infested for the first time.

#### LARCH

##### LARCH SAWFLY (Lygaconematus erichsonii Htg.)

Wisconsin. E. L. Chambers (July): Tamarack in Door and Jefferson Counties were heavily defoliated by the larch sawfly during the past 2 weeks.

#### MAPLE

##### GREEN FRUIT WORM (Grapholitha antennata Walk.)

Maine. H. B. Peirson (July 1): The green maple worm is abundant and defoliating red and silver maples at Rockland and Bristol.

New Hampshire. L. C. Glover (July 3): A local outbreak of the green maple worm has been reported from Oxford. This insect has been feeding on elm, maple, and willow along the Connecticut River bank.

##### NORWAY MAPLE APHID (Periphyllus lyropictus Kess.)

Michigan. R. Hutson (July 11): The aphid is very abundant on Norway maple at Flint, Jackson, and Lansing.

Wisconsin. E. L. Chambers (July): The Norway maple aphid is unusually abundant this summer and many specimens have been sent in for identification because of heavy falling of foliage. This was due to unusual vegetative growth but the injury was attributed to aphids.

#### MOUNTAIN ASH

##### MOUNTAIN ASH SAWFLY (Pristiphora banksi Marl.)

Maine. H. B. Peirson (July): The mountain ash sawfly was abundant on Mount Desert Island and in the Rangeley district late in June.



OAKA CARPENTER WORM (Prionoxystus macmurtrei Guer.)

Michigan. R. Hutson (July 11): Specimens of the lesser oak carpenter worm (P. macmurtrei) have been received from East Tawas. This is apparently a new record for this State.

OAK TWIG PRUNER (Hypermallus villosus Fab.)

New Hampshire. L. C. Glover (June 28): The first report of injury by the oak twig pruner was received on June 28.

A GALL WASP (Neuroterus majalis Bass.)

Massachusetts and Connecticut. E. P. Felt (July 24): The spring generation of this gall wasp has been especially abundant on oak in eastern Massachusetts and also in the vicinity of Stamford, Conn.

PINENANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Arkansas. P. H. Miller (May 23): I am enclosing pupae taken from the tips of pine seedlings (probably loblolly) found near Sheridan. (Det. by C. Heinrich.)

North Dakota. J. A. Munro (July 28): Infestation by the pine tip moth (Rhyacionia frustrana bushnelli Busck) is from moderate to light in ponderosa pine and light in jack and Scotch pine at Mandan.

A EUCOSMID (Enarmonia ratzeburgiana Sax.)

Maine. H. B. Peirson (July): Practically all terminals of white spruce at Rockland injured. Adults were emerging July 1.

SPRUCESPRUCE BUD SCALE (Physokermes piceae Schr.)

Wisconsin. E. L. Chambers (July 23): Norway and other spruces are being reported by nursery inspectors to be infested in spots in the nursery by the spruce bud scale, requiring summer application of contact sprays.

WILLOWEUROPEAN WILLOW BEETLE (Plagioderma versicolora Laich.)

Massachusetts. J. V. Schaffner, Jr. (July 24): Both larvae and adults of this imported willow leaf beetle are now very plentiful in eastern Massachusetts.

A WEEVIL (Elleschus ehippiatus Say)

Rhode Island. E. P. Felt (July 24): This small willow weevil was reported as abundant and injurious to willow near Providence.

COTTONWOOD SCALE (Chionaspis ortholobis Comst.)

Nebraska. M. H. Swenk (June 15 to 30): Reported working on willow trees in Garden County on June 29.

## INSECTS AFFECTING GREENHOUSE

## AND ORNAMENTAL PLANTS

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. W. E. Britton (July 23): This Japanese weevil was reported attacking chrysanthemum and other plants in a greenhouse at Sharon this year. It was first reported in this country from Yonkers, N. Y., in 1929 by A. J. Mutchler, of the American Museum of Natural History. In 1932 it injured iris and other plants at Lakeville. Sharon is only 4 or 5 miles from Lakeville. (Det. by B. H. Walden.)

Maryland. E. N. Cory (July 24): Literally thousands of these beetles invaded two houses, after having fed on a wide variety of plants--roses, milkweed, red clover, hollyhocks, Hemerocallis, redtop, ivy, marigold, and Pyranantha--near the houses. The owner of the house at Towson said they had an infestation in 1934. (Det. by L. L. Buchanan.)

FOUR-LINED PLANT BUG (Poecilopsus lineatus Fab.)

Connecticut. W. E. Britton (July 23): Considerable injury in some cases in Bridgeport and Hartford on chrysanthemum and dahlia.

Indiana. J. J. Davis (July 24): The four-lined plant bug was reported attacking flower-garden plants at South Bend on June 26. The specimens submitted were mature.

FERN SCALE (Hemichionaspis aspidistrae Sign.)

Maryland. E. N. Cory (July 24): Heavy infestation in a Baltimore greenhouse.

BOXWOODBOXWOOD LEAF MINER (Monarthropalpus buxi Labou.)

Maryland. E. N. Cory (July 9): The boxwood leaf miner is attacking boxwood at Govans.

Tennessee. G. M. Bentley (June 26): Serious damage by boxwood leaf miner at Bristol.

BOXWOOD PSYLLID (Psyllia buxi L.)

Maryland. E. N. Cory (June 26): Attacking boxwood at Westminster.

CRAPEMYRTLECRAPEMYRTLE APHID (Myzocallis kahawaluokalani Kirk.)

Mississippi. J. P. Kislanko (July 23): Crapemyrtles in Hattiesburg and lower Forrest County were being partially defoliated on July 20 by this aphid.

EUONYMUSEUONYMUS SCALE (Chionaspis euonymi Comst.)

New York. R. E. Horsey (July 22): A very bad infestation on Euonymus radicans vegeta at Rochester was noted on July 22. The branches and leaves were, in most instances, covered with newly set scales. A common pest.

GLADIOLUSGLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Maryland. E. N. Cory (July 24): The gladiolus thrips is abundant.

Tennessee. G. M. Bentley (July 6): A heavy infestation is ruining the blossoms on a 1-acre block.

IRISIRIS BORER (Macronoctua onusta Grote)

Indiana. J. J. Davis (July 24): The iris borer was reported damaging iris at Noblesville on July 6.

LILIESBULB MITE (Rhizoglyphus hyacinthi Bdv.)

Nebraska. M. H. Swenk (June 15 to 30): A Lancaster County correspondent complained of bulb mites infesting lily bulbs the last week in June.

MAGNOLIAMAGNOLIA SCALE (Neolecanium cornuparvum Thro)

Maryland. E. N. Cory (July 24): The magnolia scale is attacking magnolia at Glyndon.



PITTOSPORUMCOTTONY-CUSHION SCALE (Icerya purchasi Mask.)

North Carolina. R. W. Leiby (July 20): The cottony-cushion scale is now present in destructive numbers on pittosporum in Wilmington, after a noticeable absence of damage for 6 years. During this period the Vedalia beetles (Rodolia cardinalis Muls.) that were colonized there succeeded in controlling the scale. Another colony of beetles will be established shortly.

ROSEROSE SAWFLY (Caliroa aethiops Fab.)

Connecticut. W. E. Britton (July 23): This or other sawflies have been prevalent on rose around New Haven; also received from Hartford.

A SCARABAEID (Trichiotinus piger Fab.)

Maryland. E. N. Cory (July 24): T. piger is attacking roses in Baltimore.

SPIREAA BUCK MOTH (Hemileuca lucina Hy. Edw.)

Maine. H. B. Peirson (July 20): Abundant on Spiraea tomentosa at Alfred on July 20.

# INSECTS ATTACKING MAN AND DOMESTIC ANIMALS

MANA LATHRIDIID (Coninomus constrictus Gyll.)

New York. E. A. Back (July 3): C. constrictus was captured in an office building in New York City on July 3 and was sent to me for identification. It was assumed that the insect was infesting the papers, but no evidence of damaged papers could be found. It is interesting to record the presence of this insect in an office building in New York City. (Det. by W. S. Fisher.)

FIELD CRICKET (Gryllus assimilis Fab.)

California. S. Lockwood (July 24): The winged form of the field cricket is occurring in great numbers in the lower Sacramento River Valley. Complaints have been received from Woodland, Yolo County, that they are causing considerable trouble around dwellings and business houses of that town.

CHIGGER (Trombicula irritans Riley)

Ohio. N. F. Howard (July 23): The chigger mite is more abundant in central and southern Ohio than at any time since the laboratory was established at Columbus in 1926. After a spring of more frequent rainfall than at any time since 1928, a relatively hot and dry spell ensued and during this time the mites reproduced in prodigious numbers.

Indiana. J. J. Davis (July 24): Chiggers were reported from Aurora on July 17 as being annoying.

Missouri. L. Haseman (July 22): The usual number of complaints about chiggers are being received, although the pest began late, owing to the cool, backward season.

BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

Connecticut. W. E. Britton (July 23): A female was received on June 25 from Norwichtown. This makes 4 specimens recorded from Connecticut--2 from East Haddam and 1 from Killingworth. (Det. by B. J. Kaston.)

Florida. E. W. Berger and G. B. Merrill (July 22): Black widow spider occasionally seen among rocks, in wood piles, and in various other places at Gainesville and vicinity.

J. R. Watson (July 22): Following the result of newspaper publicity, a large number of black widow spiders was reported. One man said that he found six in a couple of weeks.

Kentucky. W. A. Price (July 29): Specimens have been received from Versailles, Stanton, Lexington, and Louisville.

South Dakota. H. C. Severin (July 22): Black widow spiders are being sent in frequently, but no complaints have been received from persons bitten.

Tennessee. G. M. Bentley (July 22): This spider has been sent in from different parts of the State. No serious injuries reported.

Mississippi. C. Lyle (July 23): Interest in the black widow spider has continued through July, a great many letters and specimens having been received from all sections of the State.

Nebraska. M. H. Swenk (June 15 to 30): A complaint of an abundance of the spider in a cellar in Boyd County was received on June 19.

Oklahoma. F. E. Whitehead (July 22): The black widow spider has been present in considerable numbers for several years in the vicinity of Stillwater. However, owing to newspaper publicity, more of them have been collected and many inquiries are coming from various parts of the State.

CATTLESCREW WORMS (Cochliomyia spp.)

General. E. C. Cushing (July 30): Reports received from southwestern Texas indicate that screw worms are continuing to cause enormous losses of livestock. Some ranchmen report infestations as high as 20 percent among certain classes of range animals. Owing to recent rains, the range feed is more abundant than it has been for several years; however, the rains have also caused a luxuriant growth of needle grass, one of the principal predisposing causes of screw worm infestations in sheep. The normal population of cattle is usually sufficient to keep the needle grass eaten down and prevent it from causing trouble, but the recent decrease in the numbers of cattle on the range has resulted in allowing this obnoxious grass to flourish. The screw worm situation in the Southeast is far less serious. The following tabulation summarizes the conditions in the seven States where the Bureau is conducting control operations:

State	Period	Animals examined	Cases reported	Counties involved
		Number	Number	Number
Georgia-----	June 22 - July 13	108,631	3,046	154
Florida-----	June 22 - July 6	533,053	27,290	59
Alabama-----	June 22 - July 13	611,286	178	33
Mississippi----	June 22 - July 13	352,341	103	35
Louisiana-----	June 22 - July 13	360,304	972	11
South Carolina--	June 22-29; July 6-13	12,200	27	10
Texas-----	June 22 - July 13	172,158	1,175	18

Texas. D. J. Parman and A. W. Lindquist (July 11): Screw worms, C. americana Cushing and Patton, are causing very serious losses to livestock owners in southwestern Texas, the outbreak being associated apparently with the unusually heavy precipitation during May and the early part of June. Some of the leading ranchmen in the vicinity of Uvalde state that they believe losses will be heavier in that section this year from screw worms than the losses from lack of feed during the droughts of 1933 and 1934.

STABLE FLY (Stomoxys calcitrans L.)

Iowa. C. J. Drake (July 29): Stable flies are unusually abundant this year.



Missouri. L. Haseman (July 22): During the middle of July stable flies were more annoying to cattle than for many seasons.

#### HORN FLY (Haematobia irritans L.)

Iowa. C. J. Drake (July 29): Horn flies are unusually abundant this year.

Missouri. L. Haseman (July 22): During the middle of July they were more annoying to cattle than for many seasons.

#### HORSES

##### HORSE BOTFLIES (Gastrophilus spp.)

North Dakota. J. A. Munro and F. D. Butcher (July 8): Nose and throat bot flies are attacking horses over most of the State.

##### BUFFALO GNATS (Eusimulium spp.)

South Dakota. H. C. Severin (July 22): Buffalo gnats are fairly abundant in Hudson and vicinity, attacking poultry, horses, cattle, and man.

Texas. F. C. Bishopp (July 22): A. W. Lindquist and S. E. Jones report a rather serious outbreak of E. mediovittatum Knab in the vicinity of Winterhaven. As many as 5,000 of the gnats were found on a mule at one time, being concentrated mainly along the belly and around the ears. The gnats also attack other classes of animals, including milk cows, and it was found necessary to cover the udders. The outbreak was probably accentuated by the flood in this area.

#### SHEEP

##### SHEEP BOTFLY (Oestrus ovis L.)

Utah. G. F. Knowlton (July 3): Head maggots were common at Woodruff during the past winter and spring. Reports indicate that they are common in sheep in other parts of Utah.

#### POULTRY

##### FOWL TICK (Argas miniatus Koch)

Mississippi. C. Lyle (July 23): An infestation of the fowl tick was reported on chickens at Wiggins the last of June by inspector J. P. Kislanko. This species is not known to be established elsewhere in Mississippi and very strict measures were taken to eradicate this infestation promptly.

## HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

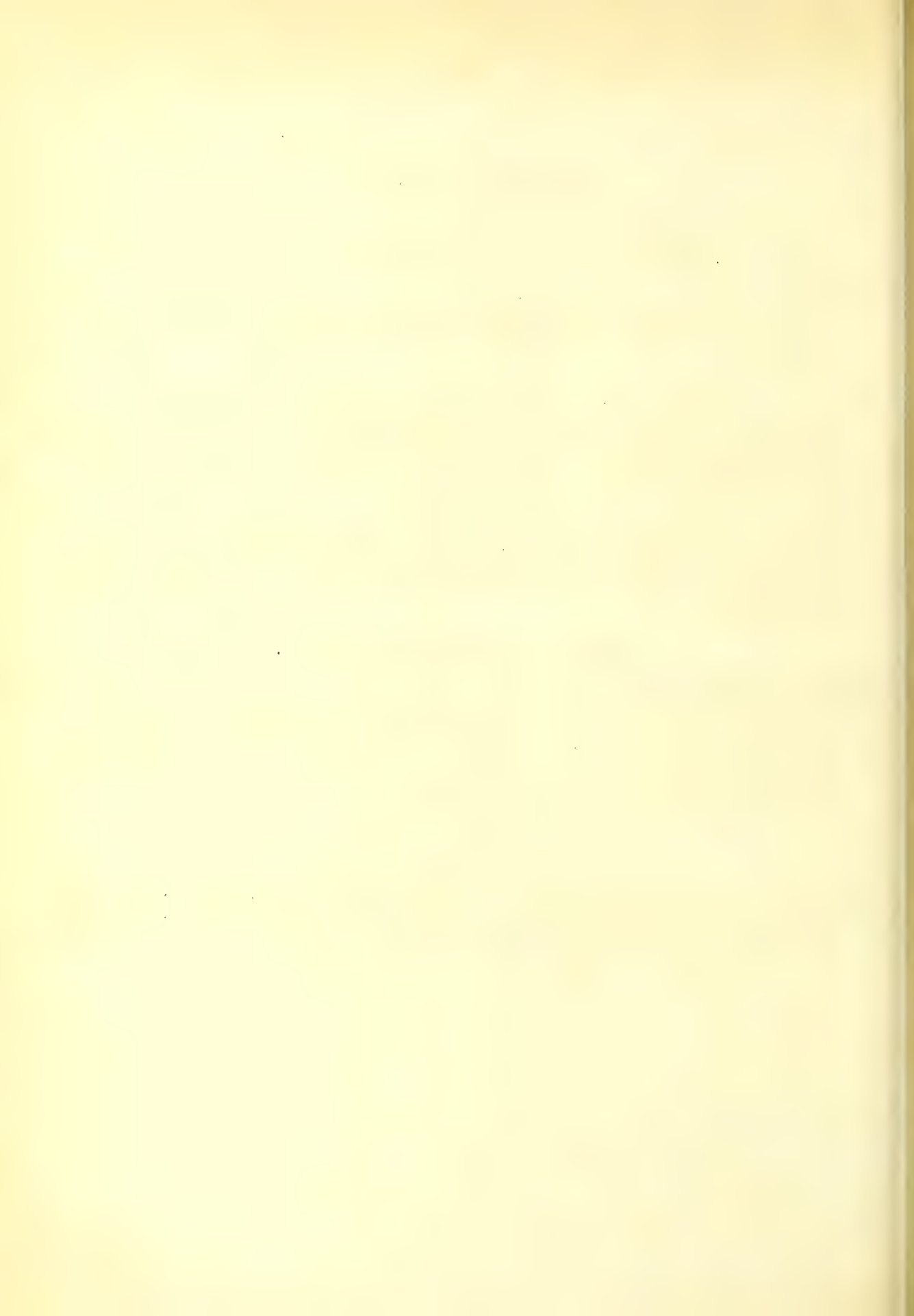
- Connecticut. W. Turner (July 22): Five new instances of damage to buildings by R. flavipes Koll. have been reported during the past month.
- Missouri. L. Haseman (July 22): Termites have been unusually active this month and we are receiving many complaints of rather serious damage. Some of our orchard label stakes put out a month ago are practically destroyed.
- Nebraska. M. H. Swenk (July 1-15): Termites, R. tibialis Bks., were reported doing damage in several instances during the period here covered. A comparatively new house in Clay County, a house in Douglas County, and an entire premise in Otoe County, including the potato crop on the lot, were the principal cases reported.
- Oklahoma. C. F. Stiles (July 22): Owing to recent newspaper articles, considerable interest is being aroused in regard to the damage caused by termites. There are quite heavy infestations in Stillwater, Norman, and Shawnee.

MEAL MOTH (Pyralis farinalis L.)

- California. H. C. Donohoe (July 1): Small numbers of adults were taken in malt-sirup bait traps in a variety of orchard locations in vicinities of Winters, Vacaville, Yuba City, and Orland during the last 2 weeks in June. This storage pest appears to be well established and widely distributed in the field in California, as it is also frequently taken in trap catches in the San Joaquin Valley.

BLOW FLIES (Lucilia spp.)

- California. H. C. Donohoe (July 1): L. sericata Meig., and L. sylviarum Meig., especially the former, are abundant in drying yards. They swarm over the freshly spread, drying apricots, feed on the juice in the cups, and cause extensive injury to quality by deposits of excrement.





## HESSIAN FLY INFESTATION AT HARVEST TIME 1935

C. M. Packard, Senior Entomologist  
Division of Cereal and Forage Insect Investigations  
Bureau of Entomology and Plant Quarantine  
U. S. Department of Agriculture  
and the

State Agricultural Experiment Stations of Missouri, Illinois, and Ohio

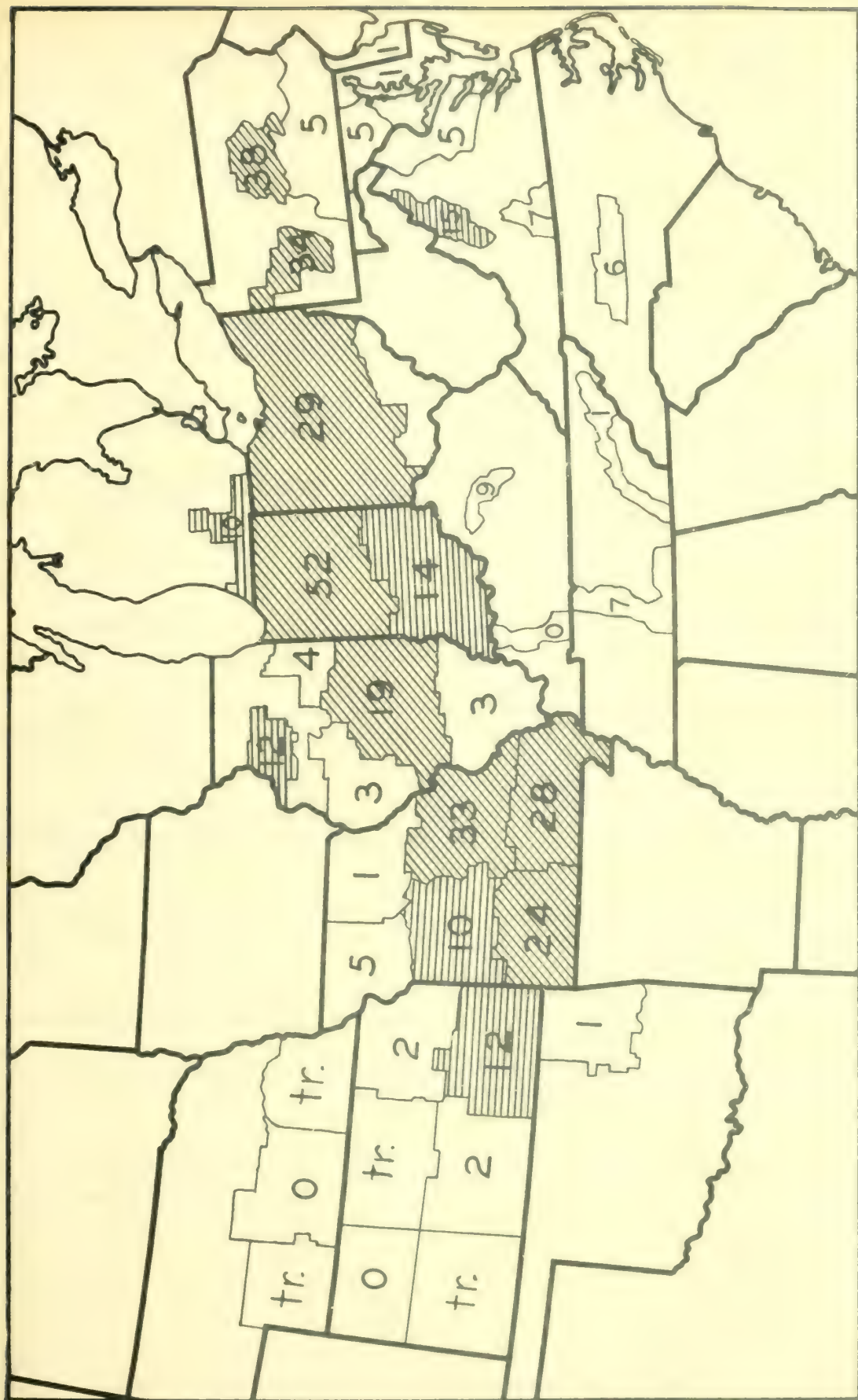
The surveys here reported cover the main winter-wheat regions of the central and eastern parts of the United States. The hessian fly has increased greatly in abundance since last year throughout much of the Wheat Belt, as a result of favorable weather conditions both in the fall and in the spring. Late summer rains last year in the East Central States, caused the growth of much volunteer wheat, which served as a medium for the development of an extra late-summer generation of fly and an important source of severe spring infestations in wheat sown this year. The situation was further aggravated by considerable wheat sown early last fall, which also became infested by the fall brood and provided an additional source of spring infestation. During the past year the rapidity with which this insect can increase in two successive favorable seasons has been strikingly manifested.

On August 22, 1935, conditions were still favorable for further increase. Parasitization and summer mortality of puparia in stubble have been moderate. Volunteer wheat is already growing, and pupation and egg laying have begun. With continued favorable conditions this coming fall, a severe outbreak seems certain, and strict observance of the safe sowing dates is especially important. Wheat stubble and volunteer should also be promptly plowed under wherever possible.

Hessian fly is present in threatening numbers throughout a belt of variable width, shown on the following map, extending from southeastern Kansas to east-central Pennsylvania, and including the southern two-thirds of Missouri, central Illinois, and most of Indiana and Ohio, with the area of greatest intensity centering in Indiana, where extremely severe infestations occurred in some fields. The Shenandoah Valley of Virginia also contains considerable infestations. Most of the data from Ohio and Illinois, and part of the Missouri data, were obtained by State entomologists. In the other places the data were obtained by Bureau entomologists and were based on individual field samples consisting of fifty stems each. The data serving as the basis of this report are summarized in the following table:

Area	Number of fields: sampled	Percentage of stems infested		
		Average	Maximum	Minimum
Nebraska:				
Southwestern-----	11	trace	2	0
South-central-----	18	0	0	0
Southeastern-----	26	trace	2	0
Kansas:				
Northwestern-----	12	0	0	0
North-central-----	26	trace	2	0
Northeastern-----	35	2	28	0
South-central-----	24	2	18	0
Southeastern-----	32	12	50	0
Oklahoma:				
Northeastern-----	18	1	6	0
Missouri:				
Northwestern-----	20	5	18	0
Northeastern-----	12	1	2	0
West-central-----	39	10	62	0
East-central-----	22	33	90	6
Southwestern-----	16	24	70	2
Southeastern-----	14	28	68	0
Illinois:*				
Northwestern-----	24	12	--	--
Northeastern-----	24	4	--	--
West-central-----	54	3	--	--
East-central-----	97	19	--	--
Southern-----	43	3	--	--
Michigan:				
Southern-----	39	10	40	0
Indiana:				
Central and northern-----	103	52	90	3
Southern-----	97	14	66	0
Ohio:*				
Except southeastern part--	340 (approx.)	29	--	--
Kentucky:				
Western-----	6	0	0	0
North-central-----	13	9	36	0
Tennessee:				
Central-----	22	7	50	0
Eastern-----	33	1	10	0
Pennsylvania:				
West-central-----	20	34	--	--
Central-----	20	38	--	--
Southeastern-----	83	5	--	--
Maryland:				
North-central-----	25	5	--	--
Eastern-----	15	1	--	--
Delaware-----	15	1	--	--
Virginia:				
Northwestern-----	20	15	--	--
Northeastern-----	45	5	--	--
South-central-----	15	7	--	--
North Carolina:				
Central-----	30	6	--	--

\*Mostly from survey by State entomologists.



Numbers indicate percentage of infestation. Horizontal crosshatching indicates areas of severe infestation. Diagonal crosshatching indicates areas of very severe infestation. tr. indicates trace--less than 1 percent.





# INSECT PEST SURVEY BULLETIN

Vol. 15

September 1, 1935

No. 7

## THE MORE IMPORTANT RECORDS FOR AUGUST 1935

During the latter part of July and the early part of August very heavy outbreaks of cutworms were reported from Michigan and Maine.

Serious damage was occasioned by the fall armyworm in the South Atlantic States and the Gulf region.

The green June beetle was reported from Delaware and Georgia, in the East Central States, and in New Mexico.

The green stink bug damaged a wide variety of plants in New Mexico and California.

Common red spiders were quite generally reported from the Gulf northward to Nebraska and also on the Pacific Coast.

Heavy hessian fly populations are present over a wide area from southeastern Kansas to central Pennsylvania.

In the East Central States the weather was adverse to the development of large populations of chinch bugs. In the West Central and the southern part of the North Central States the weather has been very favorable to this insect.

The report in the last number of this bulletin of the finding of alfalfa weevil in Mendocino County, Calif., was a mistake.

Plum curculios of the second brood were reported as very scarce in the Middle Atlantic and South Atlantic States.

A further report on the cherry scale in California, in which State it was found for the first time last year, appears in this number of the bulletin.

Blister beetles were quite generally prevalent and are doing considerable damage over the greater part of the country east of the Rockies.

Heavy infestations of the Mexican bean beetle were reported from practically its entire known range. It extended its range northward in Michigan and westward in Tennessee.

The squash bug was reported as unusually abundant and destructive from Indiana and Nebraska southwestward to Kansas and New Mexico.

Boll weevil infestations were generally heavy throughout the Cotton Belt, being particularly troublesome in the South Atlantic States.

The cotton leaf worm was very abundant and in many places quite destructive throughout the Cotton Belt, and moths flew northward earlier than usual. In Maine a moth was collected on August 6 and in Michigan on August 23.

Boll worm infestation of cotton was generally light.

Cotton aphid infestations were reported throughout the Cotton Belt.

Very heavy damage by the cotton flea hopper was reported from Oklahoma and Texas.

Bagworms were attracting unusual attention over the greater part of the country, reports having been received from Delaware to North Carolina, westward to Illinois, and southward to Texas.

Well-established infestations of the white spruce sawfly, a European pest, have been located over a considerable area in Maine, New Hampshire, and Vermont.

The larch sawfly has been discovered in northern Montana and threatens the larch stands in the upper Rocky Mountain region. This pest has not been recorded previously west of the Mississippi in the United States.

Very heavy damage to dahlias by the sunflower weevil (Rhodobaenus tredecimpunctatus Ill.) was reported from Illinois.

Unusual numbers of saddle-back caterpillars were observed in Ohio and Indiana, and reports of injury from the sting of these caterpillars were very numerous.

Reports of the occurrence of the black widow spider were very frequently received during the month in the South Atlantic, East Central, and North Central States. This spider was also reported from the Great Basin.

Up to the end of July four cases of Rocky Mountain spotted fever were reported from the State of Iowa.



THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA  
FOR JULY AND AUGUST 1935

Cool, wet weather in June and heavy rains in early July in Manitoba and Saskatchewan resulted in irregular and retarded hatching and slow development of grasshoppers, and in reduced crop damage. Organized control efforts, involving the widespread use of poisoned bait, were continued in the infested areas throughout the Western Provinces. In Manitoba the disease Empusa grylli was reported to be causing high mortality among the roadside and two-striped grasshoppers, and had appeared in areas in Saskatchewan where rains had been frequent. Crop damage has been comparatively light in Manitoba and Saskatchewan, except in the south-central part and local areas of the latter Province. Losses were occurring in some sections of southern Alberta, where they were accentuated by drought. Winged adults were becoming conspicuous in parts of the Prairie Provinces by the end of July. No extensive migrations have been reported. Egg laying was general by mid-August, and in the Red River Valley, Manitoba, adults were abundant enough to deposit sufficient eggs to create a menace in 1936. Central Manitoba was comparatively free of the insects. In British Columbia, grasshoppers were reported to be increasing on the ranges in the Kamloops area, and in the Cariboo district.

The outbreak of the pale western cutworm was fairly widespread in Saskatchewan and Alberta, but severe damage occurred in only a few areas. The largest area of general and severe infestation was in the Shackleton-Leader-Fox Valley area of Saskatchewan, extending for a short distance into Alberta. Severe local infestations also occurred in several areas of the drier districts of Alberta, centering on Lethbridge. Heavy rainfall in May and June in many areas has eliminated the pale western cutworm as an economic pest for 1936. Over a large part of the two Provinces, however, where rainfall was only sufficient to hold the insects in check, damage in 1936 may be expected to be about the same as this season.

The red-backed cutworm also caused crop damage locally in the Prairie Provinces.

Cutworms of several species were exceptionally abundant throughout a large part of the cultivated areas of the Provinces of eastern Canada, and in many places caused unusually severe damage to various field and garden crops. An outbreak of the spotted cutworm in southwestern Ontario resulted in the destruction of a large part of the sweetclover seed crop.

Second-year white grubs are prevalent in timothy and hoed crops in southern Quebec, and have caused destruction locally to sugar beets and strawberry plants in southern Ontario.

As during the last several seasons, blister beetles of several species are widespread in the Prairie Provinces, inflicting damage chiefly to leguminous shrubs and field and garden plants. A reduction in their numbers as compared with 1934 has been recorded in certain areas.

The wheat-stem sawfly is fairly abundant throughout southern Alberta, and general damage is expected. Injury by this species is generally severe in the infested areas of Saskatchewan, where it was accentuated by uneven ripening and hot weather, particularly in districts where the crop was not badly rusted. Light damage has been reported in Manitoba, but where the wheat is heavily rusted the larvae are starving and many are dying.

The sugar beet root maggot, which was first found causing damage to late-sown beets in the Barnwell district of Alberta in 1934, has again appeared in that section.

Adults of the beet webworm have been extremely numerous throughout western Manitoba and Saskatchewan and locally in southern Alberta.

Heavy flights of moths of the sod webworm (Crambus trisectus Walk.) occurred throughout southern Ontario. The larvae of this species had attacked pasture fields, corn, tobacco, and other crops. There was also general and widespread injury to lawns and golf courses by sod webworms in this section.

An unusually severe outbreak of the pea aphid developed in sections of Quebec and Ontario. Damage was less serious than was anticipated, probably as a result of the onset of weather conditions unfavourable to the aphids.

The European earwig appeared in exceedingly large numbers in the infested areas of southwestern British Columbia, and is proving destructive to garden crops in urban areas.

The black cherry aphid again appeared in outbreak form on sweet cherry trees, in the Niagara district of Ontario.

Injury by the codling moth in the Niagara district is much less severe than last year. The species is in evidence in some sections of the Annapolis Valley, Nova Scotia.

First-generation adults of the oriental fruit moth were found in all districts of the Niagara Peninsula, but were in smaller numbers than in former years. The species is much less abundant than in 1934 and injury is slight so far.

The gray-banded leaf roller is decreasing the apple crop prospects somewhat, in the Annapolis Valley, Nova Scotia.

As usual, the rose chafer appeared in outbreak form in various sandy sections of southern Ontario.

Adults of the grape leafhopper came through the winter in immense numbers in many vineyards in the Niagara district. Injury by these insects is severe in unsprayed and poorly sprayed vineyards.



Heavy infestations of the fall webworm were reported locally in Nova Scotia, Quebec, and southern Ontario. A more general outbreak occurred in Manitoba, and severe infestations occurred in various localities in Saskatchewan and Alberta.

Adults of the European spruce sawfly, in flight during the first week of June in central New Brunswick, were several times more numerous than in 1934. In the Gaspé Peninsula, Quebec, the infestation continues to be heavy and an increase in mortality of the trees is inevitable. The infestation has increased considerably in Kamouraska County, Quebec, and some of the trees are dying. The species has been found in Cumberland and Pictou Counties, Nova Scotia, but does not appear to be present yet in other parts of that Province.

The yellow-headed spruce sawfly caused extensive defoliation of spruce in northern Saskatchewan and northern Alberta. Indications are that it will eventually become generally distributed throughout the southern portion of these Provinces.

A severe outbreak of the mountain pine bark beetle, affecting lodgepole pine, has been found in the Kootenay National Park, British Columbia. It is believed that the outbreak has been spreading during the past 5 years.

Heavy infestations of the satin moth have been reported in a number of localities in Prince Edward Island; the Amherst and Springhill districts in Nova Scotia; and in Sackville, New Brunswick. The moths were emerging on July 13 in Nova Scotia. The species is reported to be comparatively scarce over the greater part of the area of infestation in British Columbia.

Reports of increased abundance of mosquitoes, as compared with previous years, have been received from New Brunswick, southern Quebec, sections of Ontario, and the Western Provinces. They were noted as extremely abundant and annoying throughout the three Prairie Provinces, and were reported to be an exceptionally severe pest in the Kamloops area and the Cariboo district of British Columbia.



## GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

Ohio. E. W. Mendenhall (August 19): Melanoplus femur-rubrum DeG., M. atlantis Riley, and Camula pellucida Scudd. are quite destructive to nursery stock in some nurseries in Franklin County.

Illinois. W. P. Flint (August 22): There is some indication of grasshopper populations building up over most of central and north-central Illinois. In a few places grasshoppers are sufficiently abundant to justify poisoning.

Iowa. C. J. Drake (August 23): Grasshoppers are very abundant along the Missouri River, the heaviest infestation being south from Woodbury and Harrison Counties. Light and spotted infestations occur throughout the western half of the State. The species concerned are the lesser migratory and the differential (M. differentialis Thos.) and two-lined (M. bivittatus Say) grasshoppers. Some poisoned bait has been used as far east as Story and Wapello Counties. The grasshopper population is probably larger than it has been any time during the past 10 years.

North Dakota. F. D. Butcher (August 21): Grasshoppers have developed about as indicated in all parts of the State. Egg laying, although late, is taking place in all sections. Range-land species are very abundant in some western counties. C. pellucida continues to be dominant in northeastern counties. M. bivittatus seems to be slightly on the increase.

Kansas. H. R. Bryson (August 20): One report of grasshoppers being abundant at Clayton. M. differentialis and M. bivittatus are present in larger numbers than last year.

Nebraska. M. H. Swenk (July 15 to 31): Grasshoppers were reported damaging alfalfa in Johnson County on July 18. A garden in Furnas County was seriously damaged by July 23. Grasshoppers were present in Harlan County in sufficient numbers to seriously damage alfalfa and other crops. (August 15): Grasshoppers were damaging young alfalfa fields in southern Butler County between August 10 and 13. The differential grasshopper and the red-legged grasshopper were defoliating apple trees at Verdon, Richardson County, on August 13.

Oklahoma. C. F. Stiles (August 21): Several species of grasshoppers are doing some damage to cotton throughout the central and western parts of the State.

## CUTWORMS (Noctuidae)

Maine. H. B. Peirson (August): The greasy cutworm (Agrotis ypsilon Rott.) was unusually abundant at Bar Harbor from August 1 to 10.

Michigan. R. Hutson (August 15): Beginning about July 25 we had the worst infestation of cutworms on all sorts of crops that we have ever had. The principal species concerned was the variegated cutworm (Lycophotia margaritosa saucia Hbn.), accompanied, in many instances, by the true armyworm (Cirphis unipuncta Haw.). Oats had been lodged and in these oat fields large populations of cutworms accumulated and migrated with the armyworm. This outbreak is unusual in that usually by the 4th of July all the cutworm and armyworm infestations have been cleaned up through natural causes.

Nebraska. M. H. Swenk (July 31): The cotton cutworm (Prodenia ornithogalli Guen.) was reported severely attacking onion plants in Merrick, Dodge, and Buffalo Counties on July 19, 23, and 23, respectively.

#### ARMYWORM (Cirphis unipuncta Haw.)

Maine. H. B. Peirson (August): A. E. Brower reports that during July and August moths of the armyworm were far more abundant at Bar Harbor than during recent years.

Missouri. L. Haseman (August 24): Half-grown armyworms are now showing up in some areas in central Missouri.

#### FALL ARMYWORM (Laphygma frugiperda S. & A.)

North Carolina. C. H. Brannon (August 27): Injury to corn by the fall armyworm is severe and widespread over the State.

South Carolina. F. T. Bondy and C. T. Rainwater (August 3): Young corn severely injured at Florence.

Georgia. T. L. Bissell (August 6): Late corn has been severely injured by the fall armyworm in Spalding County. In a garden patch of about 500 stalks over 90 percent are infested. A report from Americus apparently involves this species.

Mississippi. C. Lyle (August 23): The fall armyworm was reported to be injuring late corn in the Brookhaven and Meridian districts.

Louisiana. W. E. Hinds (August 12): Grass worms have been moderately abundant and have done considerable damage in fields of corn and cane, but real damage has not been reported in more than a few instances.

#### VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Florida. A. N. Tissot (August 22): The velvetbean caterpillar has made its appearance. Practically mature larvae were found at Gainesville on August 15.

BERTHA ARMYWORM (Barathra configurata Walk.)

North Dakota. J. A. Munro (August 21): Bertha armyworm injure to flax and other crops in the central counties subsided during the early part of August, owing largely to disease taking a heavy toll of the worms.

A WHITE GRUB (Phyllophaga fusca Froel.)

Connecticut. W. E. Britton (August 22): Grubs ate roots of budded seedlings and probably not more than 10 percent of the apple and pear stocks had been injured. (Det. by R. B. Friend.)

A WHITE GRUB (Ochrosidia sp.)

Oregon. M. C. Lane and E. W. Jones (June 7): H. K. Dean, superintendent of the Umatilla branch station, reported serious damage by white grubs (Ochrosidia, probably reflexa Csy.) to grain and alfalfa in the Hermiston district. An examination on the above date showed a great number of larvae and some pupae in very sandy soils of this district. A number of different fields several miles apart were examined and the same kind of larvae were found in all. In many places good stands of first-year alfalfa have been killed. Wheat and rye were also being badly damaged. This pest has become noticeable only recently and may possibly become a serious pest on these very sandy soils.

GREEN JUNE BEETLE (Cotinis nitida L.)

Delaware. L. A. Stearns (July 31): C. nitida and Pelidnota punctata L. are present in abundance on grape and are actively feeding.

Georgia. O. I. Snapp (July 30): The green June beetle was unusually abundant at Fort Valley during July. Large numbers appeared about the time peaches ripened in some orchards and caused some damage by breaking the skin of the fruit and feeding on the juicy pulp.

Indiana. J. J. Davis (August 24): The green June beetle has been reported from many localities in southern Indiana. At Terre Haute on July 23 they were reported clustering on nectarines.

Kentucky. M. L. Didlake (August 23): Green June beetles abundant on fruit of peaches and tomatoes at Anchorage and Lexington.

New Mexico. J. N. Crisler (August 17): Adults of the green June beetle appeared in great numbers the latter part of July and have continued to do great damage to fruit.

JAPANESE BEETLE (Popillia japonica Newm.)

General. C. H. Hadley (August 27): Scouting during August has shown that the area of continuous spread of the Japanese beetle has moved farther



north and west than in recent years. To the north it moved to the tip of Lake Hopatcong in New Jersey and to the west to Lancaster, Pa., and Abingdon, Md. The southern spread in Delaware has not been great. Areas of extremely heavy infestation have been found in north-central and southwestern New Jersey, southeastern Pennsylvania, and northern Delaware. After August 15 the beetle population fell off rapidly and, although they may still be found at the close of the month, their numbers are greatly reduced.

#### A CHINCH BUG (Blissus hirtus Montd.)

New York. W. E. Blauvelt (August 3): Specimens received. Several lawns being injured by this pest at Saranac Lake.

Connecticut. B. H. Walden (August 16): About 1,200 square feet of creeping bentgrass at Westport all killed. Adjoining areas of mixed lawn grasses infested but not seriously injured. Insects abundant at Newtown.

#### GREEN STINK BUG (Acrosternum hilaris Say)

New Mexico. J. N. Crisler (August 17): The green stink bug appeared in Dona Ana and Eddy Counties in large numbers the last week of July and has continued to do heavy damage to fruit, garden, truck crops, and maize. The most severe damage was in the lower end of the Mesilla Valley. These insects became quite numerous in the cotton fields during the past week.

California. E. C. Essig (July 27): The green soldier or stink bug has done serious damage to a considerable acreage of commercial peach orchards in Fresno and Merced Counties in the early part of July.

C. S. Morely, Kern Co. Monthly News Bul. (August 5): Large green stink bugs are very numerous in Kern County and have injured some milo maize. These insects apparently attack the corn in the milk stage, giving the heads the appearance of wilting. All heads of corn past the milk stage are uninjured.

#### COMMON RED SPIDER (Tetranychus telarius L.)

General. H. Baker (August 22): Red spiders have caused severe injury to apples, raspberries, blackberries, and many trees and shrubs throughout northwestern Missouri, northeastern Kansas, and southeastern Nebraska. Injury became evident on raspberries and blackberries about the middle of July. Injury began to show on apples during the last part of July, with the peak of activity occurring during the period from about August 1 to 10. At the present time activity of the spiders has practically ceased.

Mississippi. C. Lyle (August 23): Inspector J. P. Kislanko reports that some pecan groves in Stone County are heavily infested with red

spider, probably due to hot dry weather earlier in the month. Injury to arborvitae was reported from the southwestern counties and also from Carrollton, Marks, and Winona by Plant Board inspectors.

Louisiana. W. E. Hinds (August 12): Cotton red spider is increasing in abundance in some fields at Baton Rouge.

Nebraska. M. H. Swenk (August 1 to 15): Severe damage by red spiders continued to be reported throughout the entire period, and extended to the north and west in the State. Severe damage, especially to elm and apple trees, was reported southeast of a line from Platte to Webster Counties. Damage to other fruit and shade trees was also frequently reported. The westernmost reports extended to a line from Antelope to Redwillow Counties.

Kansas. H. R. Bryson (August 22): The red spider continued to be the most injurious pest during the latter part of July and to date. Garden plants, flowers, fruit and shade trees, ornamental vines, and shrubbery have been attacked. Many plants either have been killed or have lost all of their leaves. Elm trees have suffered most. The infestation is known to be general over the State.

Oklahoma. C. F. Stiles (August 21): Red spiders are generally distributed over most of the evergreens in the central part of the State and are on a number of the shade trees. American elms on the courthouse square at Fairview have been partially defoliated. They seem to be on the increase throughout the State.

Washington. E. J. Newcomer (August 19): The common red spider has been extremely abundant on apples in the Yakima and Wenatchee Valleys.

California. C. S. Morley, Kern Co. Monthly News Bul. (August 5): The red spider mite is proving to be very injurious to shade trees, especially to sycamore, umbrella, and balm-of-Gilead.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT

#### HESSIAN FLY (Phytophaga destructor Say)

General. The results of a hessian fly survey are published in a supplement to No. 6 of the Insect Pest Survey Bulletin, 1935.

Iowa. C. J. Drake (August 23): Hessian flies are increasing in number throughout the winter wheat-growing sections of the State. The heaviest populations are in the southern and western parts of Iowa.

#### BLACK GRAIN-STEM SAWFLY (Trachelus tabidus Fab.)

Ohio. J. S. Houser (August 24): An analysis of the survey records shows



that in the 92 fields found to be infested by this insect, the average infestation was 37.4 percent. The highest infestation found in any one field was 72 percent. As reported last year, the outbreak is most intense in first- and second-tier counties bordering Pennsylvania about one-third of the distance across the State from the northern border. Rye is much less seriously damaged than wheat.

#### WHEAT STEM MAGGOT (Meromyza americana Fitch)

Iowa. C. J. Drake (August 23): The wheat stem maggot has done considerable damage throughout the southern half of the State.

#### CORN

#### CHINCH BUG (Blissus leucopterus Say)

Indiana. A. C. Cole, Jr. (August 21): Moderate numbers of first-brood adults are now generally dispersed through the cornfields in Tippecanoe County on foxtail grass and corn. They are gradually going to corn as the foxtail in small-grain stubble and corn becomes less satisfactory for food. Egg laying is dropping off and dissections indicate storage of fat rather than development of eggs in first-brood females, apparently in preparation for hibernation. First-instar to fourth-instar second-brood nymphs are now present in moderate numbers on foxtail and corn.

Illinois. W. P. Flint (August 22): During the past month heavy rains have continued over most of the area seriously infested with chinch bugs earlier in the spring. The infestation has been reduced to a point where very little damage will occur anywhere in the State. Continued rains will also probably reduce the second brood thereby greatly lessening the threat of damage next year.

Iowa. C. J. Drake (August 23): Weather conditions have been very favorable for the second generation of bugs, and heavy populations occur in 30 counties in the eastern part of the State. The heavy growth of foxtail and other summer grasses has provided plenty of succulent food. Unless weather conditions greatly change the situation the population in Iowa in 1936 will be much heavier than it was 2 years ago.

Missouri. L. Haseman (August 24): The month of August has been favorable for chinch bug development, but few complaints have been received.

Kansas. H. R. Bryson (August 23): Chinch bugs are not quite so scarce as last year.

#### CORN LEAF APHID (Aphis maidis Fitch)

Connecticut. N. Turner (August 21): Corn leaf aphid abundant but apparently causing little damage at Mt. Carmel.



Indiana. J. J. Davis (August 24): The corn leaf aphid was exceedingly abundant the first few days of August at Brookville and Crawfordsville. The infestations were accompanied by infections of soft rot. The aphids were apparently responsible for the rot.

#### CORN EAR WORM (Heliothis obsoleta Fab.)

Connecticut. N. Turner (August 21): Sweet corn harvested at Mt. Carmel early in August showed 30-percent infestation. Later corn is not yet infested.

North Carolina. R. W. Leiby (August 9): Usual damage to corn is evident, but in isolated spots 30-acre fields have been completely destroyed by the worms working in the throats of corn stalks.

Ohio. T. H. Parks (August 23): Sweet corn is not seriously infested now but ear worms are increasing. On the whole, there has been a reduction in population as compared with last year.

Indiana. E. V. Walter (August 21): The first egg for the season at La Fayette was found on sweet corn on July 9. Counts in field corn during the week of August 11 to 17 showed less than 1 percent of the ears infested at La Fayette and about 3 percent at Franklin. On August 20, 200 ears of sweet corn, 200 ears of popcorn, and 100 ears of field corn, full silk, were examined for eggs and none were found.

Illinois. W. P. Flint (August 22): The corn ear worm is very scarce in central and northern Illinois. Examinations to date show sweet corn running from 7 to 12 percent infested.

Iowa. C. J. Drake (August 23): The infestation is very heavy in a number of sweet-corn areas of the State, particularly in the southern and central parts. The infestation is not as heavy and is much more spotted than in 1934. Some of the sweet-corn growers are reporting heavy losses.

Missouri. L. Haseman (August 24): During the month there have been many complaints, and in central Missouri corn ears are badly infested.

North Dakota. J. A. Munro (August 21): Very few reports of injury to date.

Nebraska. M. H. Swenk (July 31): The corn ear worm was reported damaging corn plants in eastern Nebraska the latter half of July.

Kansas. H. R. Bryson (August 23): Very destructive to sweet corn and tomatoes.

Texas. A. J. Chapman (August 3): Infestation at Presidio much heavier than in any recent year. Causing serious damage in late-planted corn.

Utah. G. F. Knowlton (August 25): The corn ear worm is severely damaging tomato fruits and sweet corn at Moab and Castle Dale.

STALK BORER (Paraisema nebris nitela Guen.)

New Jersey. E. Kostal (August 5): During July the stalk borer was more abundant in Monmouth County than it has been for the past 4 years. Plants affected include corn, strawflower (Holichrysus), and zinnias.

Indiana. J. J. Davis (August 24): Full-grown stalk borers were common in corn at Marengo on August 8.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Vermont. H. L. Bailey (August 23): Moderately abundant, approaching extreme abundance, in Chittenden County. Second-, third-, and fourth-stage larvae found on August 6 at Esser. Moderately abundant at Randolph, Orange County.

Connecticut. N. Turner (August 21): The second generation is hatching and feeding marks show on late corn. Reports indicate that the first generation caused less damage than in 1934.

Wisconsin. E. L. Chambers (August 20): Scouting of counties along Lake Michigan in progress since July 15 has revealed light infestations of a few stalks each in a dozen localities in five counties formerly infested and cleaned up in 1933, indicating that new infestations are coming across the lake from Michigan.

ALFALFAALFALFA WEEVIL (Hypera postica Gyll.)

California. P. N. Annand (August 5): The occurrence of alfalfa weevil in Mendocino County, reported on page 280 of the Insect Pest Survey Bulletin August 1, was based on a misidentification. Mendocino County is not known to be infested.

GARDEN WEBWORM (Loxostege similalis Guen.)

Indiana. J. J. Davis (August 24): The garden or alfalfa webworm was seriously damaging young alfalfa at New Paris and Coshen on August 8 and 10, respectively. Reports indicate a rather general and scattered infestation in the northern counties.

Missouri. L. Haseman (August 24): The garden webworm has been injuring alfalfa, young corn, and garden crops during the month.

COWPEASCOWPEA CURCULIO (Chalcodermus aeneus Boh.)

Mississippi. G. L. Bond (August 23): The cowpea curculio was reported to be doing noticeable injury in southern Mississippi. Cowpeas grown in experimental plats at State College have also been seriously injured by this species.

## FRUIT INSECTS

APPLEFLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (July 31): From Chase and Saline Counties, on July 20 and 26, respectively, came reports of the flat-headed apple tree borer working in fruit trees.

Kansas. H. B. Bryson (August 22): The prolonged droughts of last season and the present one have weakened the vitality of nursery and shade trees and thus have favored the building up of an infestation of borers. The flat-headed apple tree borer has been reported killing apple trees at Herington, Willard, and Topeka.

LEAFHOPPERS (Cicadellidae)

Connecticut. P. Garman (August 22): The first generation of the white apple leafhopper (Typhlocyba pomaria McAtee) is from light to moderate in most orchards. The second generation is just beginning and control measures are necessary in some orchards.

Virginia. W. J. Schoene (August 23): The eggs of the white apple leafhopper began hatching in considerable numbers about August 20. The various species of Erythroneura have been observed in the central part of the State, E. obliqua Say and E. lawsoniana Bak. being the most common.

Missouri and Kansas. H. Baker (August 22): Leafhoppers have been unusually abundant in many orchards in northeastern Kansas and northwestern Missouri. The summer brood was present in greatest numbers during the latter half of July.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (August 20): Many crawlers set up on peach trees during the month and the infestation is now considerably heavier than that reported on July 3.

Wisconsin. E. L. Chambers (August 20): San Jose scale not widely distributed, even in southern Wisconsin. It is being picked up in a number of new villages and cities this summer.

PEACHPLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Delaware. L. A. Stearns (August 21): Mature second-brood grubs began to issue from peaches on August 15 but a small second brood is anticipated.



Georgia. O. I. Snapp (August 20): At Fort Valley first-generation adults supplied with apples and pears deposited very few eggs during the month. Jarrings in August revealed very few adults on trees in some orchards heavily infested earlier in the season, and it is believed that the beetles are now migrating toward places of hibernation.

Missouri. L. Haseman (August 24): The plum curculio was late in appearing in Missouri orchards and during the first 2 weeks in August considerable numbers of larvae were maturing in plums at Columbia.

Mississippi. M. D. Peets (August 23): The plum curculio seriously injured late peaches in southwestern Mississippi.

#### PEACH BORER (Aegeria exitiosa Say)

Georgia. O. I. Snapp (August 20): The peak of pupation at Fort Valley occurred during the past week. Field mice and rats are destroying many pupae in some orchards. In other orchards pigs have reduced the number of pupae.

Tennessee. G. M. Bentley (August 20): The peach tree borer appears to be very plentiful in the commercial and home orchards in all sections of the State where paradichlorobenzene has not been used.

#### LESSER PEACH TREE BORER (Aegeria pictipes G. & B.)

Tennessee. G. M. Bentley (August 20): More prevalent this year than usual.

#### EUROPEAN EARWIG (Forficula auricularia L.)

Washington. E. J. Newcomer (August 19): During July several reports of the occurrence of the earwig in Yakima were received. In one instance the insects were doing considerable damage to ripening apricots and peaches on back-yard trees.

#### CHERRY

##### CHERRY FRUIT WORM (Laspeyresia packardi Zell.)

Washington. E. J. Newcomer (August 21): A lepidopterous larva was quite common in sour cherries during July in the vicinity of Kent, Wash. At least 10 percent of the cherries were infested. It is probably the same species reported from British Columbia, L. packardi Zell. It was later determined that this insect occurs throughout the region between Seattle and Tacoma.

##### CHERRY FRUIT FLY (Rhagoletis cingulata Loew)

Washington. E. J. Newcomer (August 19): A single maggot, probably this species, was found in a sour cherry near Kent on August 10.

Oregon. S. C. Jones (August): Larvae still present in late Duke cherries. Mature larvae first found on July 17.

#### CHERRY SCALE (Aspidiotus forbesi Johns.)

California. D. B. Mackie (August 1934): An infestation of the Forbes scale was discovered on Bosc pears at Mayhews, 5 miles west of Sacramento. The infestation is on old trees and apparently has been there for a few years. This is the first record of this scale in the State.

M. L. Jones (March 22, 1935): An infestation in a 10-acre planting near Sacramento was found on March 20. The infestation is in a pear orchard about 9 miles east of Sacramento on the varieties Bosc and Anjou. The infestation is light.

#### BLUEBERRY

##### BLUEBERRY MAGGOT (Rhagoletis pomonella Walsh)

New Jersey. E. Kostal (August 5): The blueberry maggot was found in native high-bush blueberries (Vaccinium corymbosum) on July 29 in Monmouth County. This fruit is usually heavily infested through the month of August in this locality.

#### PECAN

##### FALL WEBWORM (Hyphantria cunea Drury)

Florida. E. W. Berger and G. B. Merrill (August 22): The fall webworm has been observed at Melrose, principally on wild persimmon.

Tennessee. G. M. Bentley (August 20): In the forests and on isolated trees on farms they frequently make many webs, and in dim daylight the trees have the appearance of being covered with a white veil.

Mississippi. C. Lyle (August 23): Fall webworms are reported as generally distributed over the southwestern counties, while in other parts of the State they are not as numerous as they were earlier in the season and are even scarce in the Grenada district.

##### WALNUT CATERPILLAR (Datana integerrima G. & R.)

Florida. A. N. Tissot (August 22): The walnut defoliator is still abundant in some pecan orchards and has practically defoliated some trees.

Mississippi. G. L. Bond (August 23): The walnut caterpillar was abundant on pecan trees along the coast on August 19.

##### PECAN WEEVIL (Curculio caryae Horn)

Georgia. T. L. Bissell (August 3): The first emergence of the pecan weevil, one female, occurred on July 17 at Experiment. Eleven more have emerged.

## TRUCK - CROP INSECTS

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. N. Turner (August 21): The Asiatic garden beetle is reported to be very abundant in Greenwich and is causing serious damage to shrubbery. It is also reported by C. H. Hadley from Putnam, in the northeastern corner of Connecticut.

CARROT BEETLE (Liagrus gibbosus DeG.)

Missouri. L. Haseman (August 24): The carrot beetles have continued to come to light during the month in considerable numbers.

Washington. M. C. Lane and H. P. Lanchester (August 23): A good many carrot beetles have been taken in a light trap at Walla Walla during the past few days.

## BLISTER BEETLES (Meloidae)

Maine. H. B. Peirson (August): On August 1 adults of the black blister beetle (Epicauta pennsylvanica DeG.) were stripping tomato and aster over a small area at Fort Fairfield.

Connecticut. W. E. Britton (August 22): Considerable damage by E. cinerea Forst. was reported on August 19.

Maryland. E. N. Cory (August 2): E. vittata Fab. is attacking tomato vines at Upper Marlboro.

Ohio. E. W. Mendenhall (August 5): The blister beetle (E. vittata) is quite numerous, feeding on potato plants in Clermont County.

Kentucky. M. L. Didlake (August 23): Margined blister beetles (E. cinerea marginata Fab.) are injuring dahlias at Prospect and Stamping Ground.

Missouri. L. Haseman (August 24): A few complaints have been received regarding blister beetles but at Columbia they have been unusually scarce.

Nebraska. M. H. Swenk (July 15-31): D. B. Whelan found potato fields being defoliated by Macrobasis segmentata Say on July 28, while both potatoes and alfalfa were found infested with E. maculata Say. A Dawes County correspondent reported blister beetles injuring potatoes and beets on July 31. Specimens of the blister beetle Lytta reticulata Say were sent in on July 20 from Morrill County, where they were injuring beans and other garden truck.

Kansas. H. R. Bryson (August 22): Blister beetles were reported to be very abundant at Brookville and Sedan.

Mississippi. C. Lyle (August 23): The margined blister beetle (E. cinerea



marginata) was reported injuring tomatoes at Prairie on August 7. E. lemniscata Fab. was reported from the northwestern counties and also from Meridian, where late tomatoes were severely injured.

Oklahoma. F. A. Fenton (August 20): Tomatoes were defoliated in several sections by blister beetles, chiefly a large gray species.

#### POTATO AND TOMATO

##### TOMATO WORMS (Phlegethontius spp.)

Indiana. J. J. Davis (August 24): The tomato worms P. quinquemaculata Haw. and P. sexta Johan. have been very abundant. In some fields near La. Fayette on August 1 about 20 percent of the green tomatoes were destroyed. This type of injury has been reported to be rather general in Indiana.

Missouri. L. Haseman (August 24): During the latter half of August there has been an increase of the tomato hornworm in central Missouri.

Nebraska. M. H. Svenk (July 15-31): The tomato hornworm (P. quinquemaculata) was reported injuring tomato plants in Lincoln County on July 23.

##### POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Vermont. H. L. Bailey (August 22): Potato flea beetles are very abundant throughout the State and have been the chief cause of premature dying off of plants in many potato fields.

Maryland. E. N. Cory (August 22): A heavy infestation observed on potatoes and buckwheat in Garrett County.

North Dakota. J. A. Munro (August 21): The potato flea beetle is reported to be abundant in Walsh County.

##### A POTATO FLEA BEETLE (Epitrix sp.)

California. J. C. Elmore (August 12): The potato flea beetle was very destructive to the lower leaves of producing tomato vines in Orange County. Actual commercial damage was not reported by tomato growers.

##### POTATO LEAFHOPPER (Empoasca fabae Harr.)

Vermont. H. L. Bailey (August 23): Potato leafhoppers are very abundant in most sections of the State.

Connecticut. N. Turner (August 21): Unsprayed potatoes are dead as a result of dry weather and tipburn.

Ohio. N. F. Howard (August 21): Potato leafhopper on beans is not injurious in central Ohio and it appears that multiplication was retarded by very wet weather.

Michigan. R. Hutson (August 15): The potato leafhopper is extremely abundant in dahlia plantings.

#### TARNISHED PLANT BUG (Lygus pratensis L.)

Indiana. J. J. Davis (August 24): The tarnished plant bug was damaging potatoes and celery the last of July and the first of August. Later in August they disappeared and apparently caused but little serious damage. This species was reported damaging gladiolus at Goshen on August 2.

#### A PLANT BUG (Phthia picta Drury)

Texas. F. L. Thomas (August 22): S. E. Jones, Winterhaven, records the first occurrence this year on July 13. Present in destructive numbers by the latter part of the month.

#### A PENTATOMID (Arvelius albopunctatus DeG.)

Texas. F. L. Thomas (August 22): First found on tomato during the latter part of July, causing all fruit that is punctured to be worthless.

#### BEANS

##### MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

Vermont. H. L. Bailey (August 23): The Mexican bean beetle is reported moderately abundant in Windsor County.

Connecticut. N. Turner (August 22): Moderately abundant on garden beans.

Delaware. L. A. Stearns (August 21): The Mexican bean beetle is more abundant on this date than in an average year.

North Carolina. C. H. Brannon (August 27): We have had a normal infestation throughout the State.

Ohio. N. F. Howard (August 21): The Mexican bean beetle continues to be injurious in central and southern Ohio, as well as in parts of the State where it is usually scarce.

H. C. Mason (August): Heavy rains have greatly retarded development in the South Point area.

T. H. Parks (August 23): More injury to garden beans this year than ever before.

Indiana. J. J. Davis (August 24): The Mexican bean beetle has been unusually abundant, reports coming from every section of the State.

Michigan. R. Hutson (August 15): The Mexican bean beetle is apparently extending its range this year, as we have had specimens from Big Rapids,

Manistee, Clare, and Fremont. The injury has been confined to snap beans, although a few specimens have been turned in as occurring on field beans.

Tennessee. G. M. Bentley (August 20): This pest has spread into new parts of Tennessee this year. Our extreme western counties of the State, bordering the Mississippi River, have not had this pest until this year. The beetles are abundant and doing damage in Obion County for the first time.

Alabama. N. F. Howard (August 22): H. L. Weatherby reports a rather heavy infestation at Brundidge, Pike County. This is below the main area of distribution and, together with the other isolated infestations in the far South, indicates a gradual spread into territory that has been considered unfavorable for the beetle.

Mississippi. L. J. Goodgame (August 23): The Mexican bean beetle has defoliated all the beans around Aberdeen and has spread westward.

Utah. G. F. Knowlton (August 25): Mexican bean beetles are still abundant and damaging lima beans at Moab. Two reports have been received to the effect that this insect is now present at Greenriver, Emery County.

#### WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon. B. G. Thompson (August): D. soror is more numerous on canning beans at Corvallis than for the past 2 or 3 years.

#### LESSER CORN STALK BORER (Elasmopalpus lignosellus Zell.)

Georgia. O. I. Snapp (August 8): The lesser corn stalk borer ruined a large planting of snap beans at Fort Valley early in August.

Texas. F. L. Thomas (August 22): On July 11 E. lignosellus was injuring milo at San Angelo and also at Ballinger.

#### CABBAGE

##### HARLEQUIN BUG (Murgantia histrionica Hahn)

North Carolina. R. W. Leiby (August 23): Many reports are now being received of damage to collards and cabbage. These are the first complaints of damage for the season.

Mississippi. C. Lyle (August 23): The harlequin cabbage bug was reported from Hinds and Jefferson Davis Counties. Collard was the host plant mentioned.



CUCUMBERSSTRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

Indiana. J. J. Davis (August 24): The striped cucumber beetle has been more abundant than usual and frequent rains have made the problem of control very difficult.

Ohio. B. J. Landis (July): During June and July the striped cucumber beetle was parasitized to a considerable extent by a small tachinid, probably Celatoria diabroticae Shin. Between June 11 and July 23 8 collections were made from squash plants, involving a total of 1,900 beetles, and 491 tachinid puparia were recovered from these collections. This is approximately 25.8 percent parasitization. Parasites continued to emerge for 23 days after collection.

Missouri. L. Haseman (August 24): Striped cucumber beetles have been very abundant on late cucurbits.

Mississippi. C. Lyle (August 23): The striped cucumber beetle has caused much damage to watermelons near Aberdeen by feeding on the outer surface, thus reducing their market value.

SQUASHSQUASH BUG (Anasa tristis DeG.)

Indiana. J. J. Davis (August 24): The squash bug was abundant and destructive at Goshen, Elkhart, and Terre Haute the last of July and early in August.

Missouri. L. Haseman (August 24): The squash bug has been very abundant and destructive during August.

Nebraska. M. H. Swenk (July 15-31): Squash bugs were reported from several counties in the eastern half of the State.

Kansas. H. R. Bryson (August 23): Squash bugs are very abundant wherever squashes or pumpkins are grown.

New Mexico. J. N. Crisler (August 17): The squash bug was noticed in great numbers in Dona Ana and Eddy Counties around the first of August, the heaviest infestation appearing in the lower end of the Mesilla Valley. These bugs have spread from the gardens to the tomato and maize fields and are doing serious damage.

ONIONSONION THRIPS (Thrips tabaci Lind.)

Michigan. R. Hutson (August 15): Thrips are very abundant on onions in all sections of the State. The losses on marshes around Gun Lake in

Allogan County are very great.

AN ONION APHID (Aphis allii Licht.)

Nebraska. M. H. Swenk (July 31): Some green onions in Lincoln County were reported infested with aphids on July 22.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (August 20): Pepper weevil infestations increased rapidly and threaten heavy losses--25 to 50 percent--in Orange County. High temperatures have contributed to this condition.

SUGAR BEETS

BET LEAFHOPPER (Eutettix tenellus Bak.)

Idaho. J. R. Douglass (September 1): Temperatures below normal during the month of July have had a very favorable effect on the growth of sugar beets, and the development of the beet leafhopper and the activity of the curly-top disease have been retarded. At the end of July some of the larger beets exceeded 5 inches in diameter and weighed approximately 3 pounds. It is estimated that some of the fields in this section will yield 25 tons or more of sugar beets. The greater part of the beet acreage in this section is composed of the U. S. No. 1 resistant beets.

Utah. G. F. Knowlton (July 31): Approximately 50 percent of the tomato plants in Utah have now been killed or are seriously affected by curly top. Beet leafhoppers are now more abundant on tomatoes in southern areas than farther north. (August 25): Beet leafhoppers are abundant on Russian-thistle at Moab and Greenriver. Cantaloups and cucumbers are heavily infected with curly top in these two areas.

## COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis Boh.)

North Carolina. C. H. Brannon (August 27): Infestation heavy all over the State. Damage is serious in the upper Piedmont for the first time.

South Carolina. F. F. Bondy and C. F. Rainwater (August 3): In Florence County the boll weevil is steadily increasing in fruiting fields and in other fields movement is taking place. (August 17): Population gradually increasing. Many sections report the worst damage since 1929.

Georgia. O. I. Snapp (July 22): The boll weevil increased rapidly around Fort Valley as a result of frequent rains in July. The insect became very active the latter part of July. Fortunately, a cotton crop was made before August. On account of the activity of this insect, very few bolls matured in August in many fields.

Tennessee. G. M. Bentley (August 20): More common in the cotton-growing counties of western Tennessee this year than it has been for several years.

Louisiana. W. E. Hinds (August 12): The boll weevil is reported generally more abundant than in any preceding year.

R. C. Gaines (August 3): The average infestation in 14 untreated fields in Madison Parish was 60.3 percent, ranging from 8.8 to 88.8 percent.

Mississippi. C. Lyle (August 23): In the northern part of the State the boll weevil is still causing injury to plants that are fruiting.

R. W. Harned and assistants (August): On August 3 the infestation on 3 farms in Washington County ranged from 3.2 to 64.0 percent, averaging 45 percent. On August 3 in Oktibbeha County square infestation in 15 fields ranged from 5.3 to 77.7 percent, averaging 50.6 percent, as compared with 41.2 percent the previous week and 41.6 percent the same week in 1934. In Forrest County square infestation in 2 fields was 32.3 and 33.7 percent.

Arkansas. D. Isely (August 23): The threat of injury has practically passed in the greater part of the State, probably because of the summer drought.

Oklahoma. C. F. Stiles (August 6): The infestation decreased in the central part of the State and increased in the extreme southern part. A total of 43 fields were examined in 14 counties. The highest infestation was 65 percent in Choctaw County and the lowest was 1 percent in McClain County, with an average of 13.7 percent for the 43 fields. (August 21): The infestation for the week ended August 17 ranged from a high of 32 percent in Lincoln County to a low of 3.4 percent in Payne County.



Texas. R. W. Harned and assistants (August): On August 3 two untreated plats had infestations of 5.6 and 7.7 percent and two treated plats infestations of 1.2 and 1.7 percent in Brazos and Burleson Counties. (August 10): Untreated plats, 4.0 to 8.7 percent, average 6.0 percent; treated plats, 1.2 to 3.8 percent, average 2.2 percent, in Brazos and Burleson Counties. By August 10 infestations were increasing in Calhoun County. The damage is more or less spotted. In some fields, especially in young cotton, the infestation has increased to such an extent that the cotton has stopped blooming, although many squares are still present. (August 17): Infestation continues to increase. Damage is serious in most fields of young cotton.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Maine. H. B. Peirson (August): A single moth was taken at bait on August 6 at Bar Harbor by A. E. Brower, an unusually early record.

Michigan. R. Hutson (August 26): The moth was reported from Hillsdale on August 23. This is the earliest record for several years.

North Carolina. C. H. Brannon (August 27): Severe infestation on cotton over the entire Piedmont.

South Carolina. F. F. Bondy and C. F. Rainwater (August 10): Moths caught in light traps and two larvae were found on August 8 at Florence. (August 17): No more larvae found.

Georgia. T. L. Bissell (September 3): The cotton leaf worm has appeared at Experiment. The first larvae were noted August 27. Today a large number of pupae were found.

Tennessee. G. M. Bentley (August 20): This insect made its first appearance in the State in Shelby County on August 5. Since that date it has spread into many of our western cotton-growing counties. On August 17 it was reported as being in Henry County. No reports have been received of its being in central Tennessee.

Missouri. L. Haseman (August 24): The cotton leaf worm began to attract attention in the southern Missouri cotton-growing district about August 15. By August 20 numbers of moths were present and were damaging ripe peaches at Columbia.

Arkansas. D. Isely (August 23): There is a widespread outbreak throughout eastern Arkansas. Infestations in the western part of the State are more scattered.

Mississippi. C. Lyle (August 23): Reported from most parts of the State during August. In the southeastern counties the damage caused was less than expected, probably because of parasites and predators. In the northwestern hill counties poison is being applied, whereas in the Delta section large areas have been dusted with airplanes.

Louisiana. W. E. Hinds (August 12): The cotton leaf worm has been reported from the following parishes: Madison, Caldwell, Franklin, Lafayette, and Vermilion. (August 21): Damage reported from over the entire State wherever cotton is grown. Impossible to get calcium arsenate.

Oklahoma. C. F. Stiles (August 6): Cotton leaf worms are lightly distributed over the State, with heaviest infestation in Jefferson, Love, Bryan, and Choctaw Counties. (August 21): Reported from practically all counties in the State. So far the damage has not been serious, except in a few instances. The moths of the first Oklahoma brood are now depositing their eggs.

Texas. D. M. McEachern (August 17): The cotton leaf worm made its appearance in the Presidio and Castolon sections of the Big Bend the last week in July. This is approximately a month earlier than the pest ordinarily appears. This insect also made its appearance in the irrigated section around Fort Stockton, in Pecos County, the second week in August. At this time damage is noticeable in the limited cotton acreage in this section.

F. L. Thomas (August 22): The fourth generation of adults since this insect first reached the State is now in full flight. This is the third generation to infest cotton at College Station and unprotected fields have been completely stripped of foliage.

K. P. Ewing and R. L. McGarr (August 3): Observations in the Corpus Christi and Robstown area last week end showed nearly all fields of mature cotton stripped. Observations in Refugio County yesterday showed some fields stripped and others protected. (August 10): Very heavy infestation this week covering half of Calhoun County. In many fields the heaviest infestation of the season occurred this week. Observations last Friday afternoon showed the leaf worm was getting out of control on a few farms in the county. (August 17): A few hundred acres of cotton in the county have been stripped or partially stripped.

New Mexico. J. N. Crisler (August 17): The first generation of the cotton leaf worm has pupated in the Mesilla Valley.

Arizona. T. P. Cassidy (August): The infestation in Arizona is so light that no commercial damage will result from the second generation. There is a remote possibility that an influx of moths from western Texas may cause damage.

#### BOLL WORM (Heliothis obsoleta Fab.)

Oklahoma. C. F. Stiles (August 21): Moths are present in large numbers in some fields. So far the damage has been light.

Texas. F. L. Thomas (August 22): Owing to hot, dry weather, the second-generation worms have failed to materialize, even where fairly large numbers of eggs had been laid.



R. W. Moreland and A. B. Beavers (August): In Brazos and Burleson Counties on August 3 examined 3,000 terminals and found 746 eggs, an average of 24.9. For the week ended August 4, 1934, the average was 1 egg per 100 terminals. On August 10 examined 2,700 terminals and found 2,853 eggs, an average of 105 eggs per 100 terminals.

New Mexico. D. M. McEachern (August 17): There is a light infestation in the Pecos Valley of New Mexico. Corn and cotton appear to be the only plants on which the worm is feeding.

Arizona. T. P. Cassidy (August 17): Causing some damage about 25 miles northwest of Tucson. The major damage is being caused to young bolls. Most of the larvae are about full grown.

#### PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (August 17): Boll infestation records in several fields near Presidio averaged 30.8 percent. The heavily infested fields were located in the drought area above the Conchos River, where there is a limited cotton acreage.

#### COTTON SQUARE BORER (Styrmon melinus Hbn.)

Texas. D. M. McEachern (August 17): The cotton square borer has caused considerable damage to one field of cotton on the La Junta farm in the Presidio district of Texas.

#### COTTON APHID (Aphis gossypii Glov.)

North Carolina. C. H. Brannon (August 27): We have had several heavy infestations of the cotton aphid--some on dusted cotton, others on cotton that received no dust.

South Carolina. F. F. Bondy and C. F. Rainwater (August 3): Cotton aphid not so numerous at Florence as it was 2 weeks ago. (August 17): Aphids are on the bottom leaves in many fields.

Louisiana. W. E. Hinds (August 12): Cotton plant lice have appeared in abundance in numerous locations, especially where the dusting for boll weevils has been under way.

Texas. K. P. Ewing (August 17): In Calhoun County infestation is increasing rapidly in most fields that were dusted with calcium arsenate. The damage is severe in several fields.

#### COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy and C. F. Rainwater (August 10): Green cotton at Florence has quite a number of flea hoppers but they do not seem to be doing any damage.



Oklahoma. C. F. Stiles (August 21): The cotton flea hopper has done enormous damage throughout the eastern half of the State since the last report. The injury is decreasing at present.

Texas. F. L. Thomas (August 22): Many complaints were received from northern Texas during July and the first part of August.

K. P. Ewing and R. L. McGarr (August 17): No damage in Calhoun County except in few fields of young cotton.

Arizona. T. P. Cassidy (August 17): Experimental cotton at Arend Ranch, Pima County, grown in the immediate proximity to croton plants that were heavily infested, has shown no indication of injury. Sweepings have been made weekly since July 1 with negative results. On August 8, 100 sweepings each were made in the cotton and croton. 59 hoppers were taken from croton and none from cotton.

#### RAPID PLANT BUG (Adelphocorus rapidus Say)

Texas. K. P. Ewing and R. L. McGarr (August 10): Heavy infestation and considerable damage observed in one field in Calhoun County. Adults and nymphs were brought into the office from Jackson County, where the insect is reported as the principal source of damage at the present time.

#### FALSE CHINCH BUG (Nysius ericae Schill.)

Oklahoma. F. A. Fenton (August 20): Reports were received from the southwestern part of the State of shedding of cotton squares caused by the false chinch bug.

#### A PENTATOMID (Chlorochroa uhleri Stahl)

Arizona. T. P. Cassidy (August 10): An intensive inspection was made in experimental cotton grown 25 miles southwest of Tucson on August 3. Six species of hemipterous insects were found. The relative abundance of C. uhleri and all other species was about 10 to 1. The shedding was confined almost entirely to young bolls. Examinations made of a number of plants showed that from 70 to 100 percent of the bolls had been injured by hemipterous insects. This is the heaviest injury of this kind ever noted here. C. uhleri seems to have migrated into the field from the desert.

#### COMMON RED SPIDER (Tetranychus telarius L.)

North Carolina. C. H. Brannon (August 27): Infestation severe on cotton in many sections of the State.

Mississippi. G. I. Worthington (August 23): More numerous on cotton in Bolivar Sunflower, and Washington Counties than for several years.

Arkansas. D. Isely (August 23): The red spider is causing more serious injury on cotton in eastern Arkansas than it has for a number of years.

## FOREST AND SHADE - TREE INSECTS

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

- Delaware. L. A. Stearns (July 24): Complaints received of infestation on arborvitae at Hockessin.
- North Carolina. R. W. Leiby (August 9): The bagworm is more injurious than usual on arborvitae all over the State.
- Ohio. T. H. Parks (August 23): Bagworms are still working on arborvitae and other ornamentals.
- Indiana. J. J. Davis (August 24): The bagworm has been very much more abundant than usual and as far north in the State as Kokomo and La Fayette.
- Illinois. W. P. Flint (August 22): These insects have been much more abundant and destructive than for any period in the last 6 or 7 years. They are now becoming full grown in central Illinois.
- Kentucky. M. L. Didlake (August 23): Bagworms on evergreens are very abundant at Lexington, Brooksville, Harlan, Anchorage, Baxter, and Hazard.
- Mississippi. C. Lyle (August 23): More than the usual number of complaints of bagworm injury to arborvitae and other shrubbery were reported from Aberdeen and Brookhaven. Specimens have also been received from Indianola and Shaw.
- Texas. F. L. Thomas (August 22): Bagworm found at Wharton, Belton, and College Station.

SATIN MOTH (Stilpnolia salicis L.)

- Washington. R. T. Webber (July): Infestations in residential sections outnumber those found in woodland. The principal woodland infestations lie between Everett and Bellingham and are centered about the tributaries of the Stillaguamish and Skagit Rivers. Here willow appears to be the most favored food plant. The largest single tract of practically complete defoliation noted is a few miles from Seattle in the Samish River Valley. This area consists of approximately 100 acres and the growth is chiefly willow. Other completely defoliated woodlands of an acre or more occur in Pierce and Cowlitz Counties. In these areas the native cottonwood (Populus trichocarpa) is the favored food plant.

A PSOCID (Cerastipsocus venosus Burm.)

- Tennessee. G. M. Bentley (June 18): In all my experience I have never seen so many psocids on the larger branches of trees as this year. We



find them on maples, oaks, yellow poplar, black walnut, and pecan. They occur in large masses, both winged and wingless forms. No injury is apparent. (Det. by A. M. Caudell.)

### BIRCH

#### A CASE BEARER (Coleophora salmani Heinr.)

Maine. H. B. Peirson (August): An outbreak of this species at Sorrento and Winter Harbor has turned the foliage brown. In places the larvae spread over to red oak and caused severe injury.

#### BRONZE BIRCH BORER (Agriilus anxius Gory)

General. E. P. Felt (August 23): Trees injured by the bronze birch borer have been noted in southern Connecticut, in the vicinity of Pittsfield and Williamstown, Mass., in southern New York, and on Long Island.

### ELM

#### EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. R. E. Horsey (August 3): A number of old and newly formed European elm scales were found on several trees of Zelkova serrata, a relative of the elm.

Ohio. E. W. Mendenhall (August 19): The European elm scale is abundant in some of the nurseries in central Ohio.

Wisconsin. E. L. Chambers (August 20): This scale has been discovered in six new localities this summer; previously known to be present in only three.

### FIR

#### AN APHID (Dreyfusia piceae Ratz.)

Maine. H. B. Peirson (August 10): Many firs are dying from attack by the fir or balsam woolly aphid at Belgrade, Dead River, Cadyville, Talmadge, and Waite.

### LARCH

#### LARCH SAWFLY (Lygaeonematus erichsonii Htg.)

Canada. J. C. Evenden (July): The forest-insect laboratory at Vernon, British Columbia, has recorded the presence of the eastern larch sawfly in the Flathead Basin, just north of the Canadian line. As in 1934, several outbreaks of a larch sawfly, determined as Nematinæ, were recorded from adjacent territory in the United States, it is very possible that the insects on both sides are of the same species. The present outbreaks have not as yet reached serious proportions and have caused no irrecoverable damage.



Montana. F. C. Craighead (August 31): The larch sawfly has been found causing serious damage to larch in northern Montana. The insect has not been previously recorded west of the Mississippi.

### LOCUST

#### LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

North Carolina. B. H. Wilford (August 15): A report came to the office yesterday concerning severe injury to the foliage of black locust by the locust leaf miner near Barnardsville.

Virginia. M. W. Blackman (August 16): B. H. Wilford reported on July 29 that during the past week several reports have been received of severe leaf-miner injury to black locusts east of Abingdon. Most of the leaves appear reddish brown.

### MAPLE

#### A GEOMETRID (Physostegania pustularia Guen.)

Connecticut. W. E. Britton (August 22): Adults very abundant and swarmed around lights in Waterbury in July; also more common than usual in New Haven. The larvae feed on maple.

### OAK

#### OAK PILL GALL (Cincticornia pilulae Walsh)

New York. E. P. Felt (August 23): The oak pill gall was found to be unusually abundant on a number of oaks at Tuxedo. The foliage of the lower branches was thickly infested.

### PLANETREE

#### SYCAMORE LACEBUG (Corythucha ciliata Say)

New York. E. P. Felt (August 23): Work of the sycamore lace bug was observed on several American planetrees in and about Tuxedo and Suffern. The insect is most abundant on trees growing in weedy and shrubby localities along streams.

Kentucky. M. L. Diddle (August 23): Lacebug injuring sycamore at Lexington.

### POPLAR

#### POPLAR LEAF STEM GALL (Pemphigus populi-transversus Riley)

Texas. F. L. Thomas (August 22): Galls on cottonwood trees were sent in from Jackson County on August 1. These galls have not been conspicuous

for several years and may indicate a recurrence of injury to the turnips and cabbages grown in this area during the winter.

### SPRUCE

#### WHITE SPRUCE SAWFLY (Neodiprion polytomum Htg.)

New England. J. V. Schaffner, Jr. (August 26): Recent surveys of spruce forests in Maine, New Hampshire, and Vermont have disclosed that this sawfly is firmly established in New England. Light infestations, covering several square miles, have been located in Maine in the northern part of Aroostook County, about 30 miles south of Fort Kent, and in Somerset County, north of Moosehead Lake. In New Hampshire light infestations were found at First Connecticut Lake and south as far as Campton. It seems to be generally distributed all over the White Mountains. In Vermont infestations were found from Newport to Stowe. Although the infestations in each case have been reported light, the sawfly is present in sufficient numbers and is distributed over such a wide area as to cause considerable alarm. The larvae were found feeding on both white and red spruce.

### WALNUT

#### WALNUT CATERPILLAR (Datana integerrima G. & R.)

Ohio. E. W. Mendenhall (August 20): Caterpillars are damaging black walnut trees and some trees are nearly defoliated.

Illinois. C. L. Metcalf (August 19): The walnut caterpillar has extensively defoliated trees in the vicinity of Urbana, many trees being from half defoliated to almost completely so.

Wisconsin. E. L. Chambers (August 20): Walnut trees throughout southern Wisconsin have been defoliated during the past 10 days.

### WILLOW

#### EUROPEAN WILLOW BEETLE (Plagiodera versicolora Laich.)

New England and New York. J. V. Schaffner, Jr. (August 26): Recently noted as far north in Vermont as Vergennes, and in New York in vicinity of Troy, Grafton, Fonda, and west to Little Falls. In Maine it has been found as far north as Biddeford.

Connecticut. M. P. Zappe (August 22): Has been very abundant in southwestern Connecticut for several years, causing considerable defoliation of willows. This year the insect is very scarce and many willows are entirely free from infestation.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. W. E. Britton (August 22): Specimens of this weevil have just been received from Stratford, in Fairfield County, just east of Bridgeport.

CHINESE MANTIS (Tenodera sinensis Sauss.)

Ohio. J. S. Houser (August 24): This is the first time I have received specimens of the Chinese mantid from the extreme southwestern part of Ohio. I have taken it once before in the State, in a nursery near Wooster.

AZALEA

AZALEA LACEBUG (Stephanitis pyrioides Scott)

New York. E. P. Felt (August 23): The azalea lacebug was reported as injurious to azalea in the White Plains district.

DAHLIA

SUNFLOWER WEEVIL (Rhodobaenus tredecimpunctatus Ill.)

Illinois. C. L. Metcalf (August 19): We have been receiving reports of serious destruction of dahlias by the sunflower beetle, or cocklebur billbug, from the Chicago and north-shore district and also from the extreme southern part of the State, in Alexander County. The first reports from the southern part of the State were dated August 9 and those from Chicago, August 13. Specimens received are apparently in the full-grown larval stage. One grower reported that 4 acres of dahlias were beginning to die down as a result of this attack. Another writes that the damage is very extensive, many plantings being ruined just as the plants are beginning to bloom. All report that this is the first time they have had trouble with a borer in dahlias. In one instance the injured plants were accompanied by a diseased condition designated as "stunt."

DEODAR

DEODAR WEEVIL (Pissodes deodarae Hopk.)

North Carolina. R. W. Leiby (August 9): Severe damage is being done to deodar cedar trees. It is greater this season than usual.



GLADIOLUSGLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Ohio. E. W. Mendenhall (August 9): The gladiolus thrips is very injurious in gladioli plantings in Newark and Zanesville and this pest seems to be spreading over the State.

Indiana. J. J. Davis (August 19): The gladiolus thrips is destructive to gladiolus flowers at Hammond.

Michigan. R. Hutson (August 15): Extremely abundant in gladiolus fields about Lansing.

Oregon. D. C. Mote (August): Generally not so abundant as last year, although the injury is severe in some gardens.

IRISIRIS BORER (Macronoctua onusta Grote)

Indiana. J. J. Davis (August 24): The iris borer was noticeably destructive at La Fayette and Logansport early in August.

MAGNOLIAMAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsey (August): Full-grown scales, very conspicuous with the white covering now present, are to be seen on the twigs and branches of Magnolia kobus borealis and M. acuminata, both large trees. Also reported on many different magnolias in all parts of Rochester. On August 19 the scales were full of live and active young. On August 20 they were emerging and young were numerous on the branches. A serious pest at Rochester since 1925.

E. P. Felt (August 23): The magnolia scale was found in some numbers on Virginia creeper at Bronxville.

Kentucky. M. L. Didlake (August 23): Magnolia scale on M. soulangeana at Barbourville.

# INSECTS ATTACKING MAN AND DOMESTIC ANIMALS

## MAN

### MOSQUITOES (Culicinae)

Vermont. H. L. Bailey (August 23): Mosquitoes reported in extreme abundance from the vicinity of Lake Dunmore, in Addison County. Recreational activities were seriously restricted and many campers were reported as leaving. This condition came on suddenly late in July and subsided gradually during the first 2 weeks in August.

New York. E. C. Cushing (August 27): The recent floods occurring in southern and central New York State have brought about ideal conditions for the production of enormous numbers of the floodwater mosquito (Aedes hirsuteron Theob.) and the common swamp mosquito (A. vexans Meig.).

Florida. W. V. King (August 27): With heavy rainfall throughout the State during June and July, severe infestations of salt-marsh mosquitoes, principally A. taeniorhynchus Wied., were reported from nearly all sections of the coast.

### SADDLE-BACK CATERPILLAR (Sibine stimulea Clem.)

Ohio. J. S. Houser (August 24): The saddle-back caterpillar is much more plentiful this season than usual. Ordinarily the caterpillars occur singly, but this season goldenglow is reported as having been almost defoliated. Their feeding has also damaged corn leaves.

Indiana. J. J. Davis (August 24): Saddle-back caterpillars were reported from Warsaw as abundant in pear on August 20 and causing considerable irritation.

### PUSS CATERPILLAR (Megalopyge opercularis S. & A.)

North Carolina. C. H. Brannon (August 26): According to a physician's report, the sting of the puss caterpillar was almost fatal to a patient in Cabarrus County.

### BLOOD-SUCKING CONENOSE (Triatoma sanguisuga Lec.)

Florida. E. W. Berger and G. B. Merrill (August 22): A correspondent at Clarksville writes: "Myself and a friend have undergone much suffering and apparently have narrowly escaped death after being bitten or stung."

### WHEEL BUG (Arilus cristatus L.)

Kentucky. M. L. Didlake (August 23): Wheel bug at Lexington. It had inflicted a wound when caught in a boy's clothing.

WEEVILS (Brachyrhinus spp.)

Maine. H. B. Peirson (August 1935): Strawberry crown girdler (B. ovatus L.) found on August 8 at Bailey's Island and Guilford. Many adults coming into houses.

Vermont. H. L. Bailey (August 23): Black vine weevil (B. sulcatus Fab.) reported in great abundance in old house at Danville.

Washington. M. H. Hatch (August 6): Numerous reports have come in of the strawberry root weevil (B. ovatus) occurring in houses and cabins in various parts of western Washington this summer.

FLEAS (Ctenocephalides spp.)

Ohio. T. H. Parks (August 23): Cat fleas (C. felis Bouche) and dog fleas (C. canis Curt.) are very troublesome this year. Some houses are overrun by them and lawns are also well populated.

Indiana. J. J. Davis (August 24): Fleas have been unusually prevalent according to the many reports from all sections of the State.

BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

Virginia. W. J. Schoene (August 23): Black widow spiders are being brought in frequently from various sections of the State.

North Carolina. R. W. Leiby (August 9): Owing probably to recent publicity in the State, specimens are being sent to the office more frequently than usual. Records of bites usually accompany them.

Georgia. O. I. Snapp (July 30): Many inquiries being received constantly.

T. L. Bissell (August 3): Nine spiders, males and females, were found in the corners of insect cages with open bottoms placed on the ground. There has been an increase in such finds during the past 2 or 3 years. Several cases of humans who had been bitten by these spiders have been treated in Atlanta hospitals, at least one case being fatal this year.

Florida. E. W. Berger and G. W. Merrill (August 22): A correspondent speaks of the unusually large number of black widow spiders. Several people had been bitten and made very ill, suffering greatly.

Kentucky. M. L. Didlake (August 23): Black widow spiders at Krupp and Pineville.

Tennessee. G. M. Bentley (August 20): Owing to press articles in regard to the black widow spider and reports of people suffering from its bites, Tennessee is black widow spider minded at this time. Scores of specimens have been brought into the office.



North Dakota. J. A. Munro (August 21): Specimens were collected at Fargo on July 23 and August 21, and were sent in from Slope County on August 21.

Nebraska. H. H. Swenk (July 31): On July 25 in Nance County a specimen was found. A report from Adams County was received on July 27.

Oklahoma. F. A. Fenton (August 20): Several requests for information on the black widow spider have been received, also specimens.

Utah. G. F. Knowlton (August 24): A black widow spider was found in an occupied hotel room at Moab.

#### A TICK (Dermacentor variabilis Say)

Iowa. R. W. Wells (July 29): Incidence of Rocky Mountain spotted fever: "Thus far in 1935, four cases of Rocky Mountain spotted fever have been reported to the Iowa State Department of Health. The counties concerned are Linn, Lee, Poweshiek, and Union, and are widely separated in the southern half of the State. The first case, that of a little girl in Linn County, resulted fatally."--Iowa State Health Dept. Weekly Health Message, July 29, 1935.

#### CATTLE

#### SCREW WORMS (Cochliomyia spp.)

Southern States. E. C. Cushing (August 27): In the Southeastern States screw worms have caused little trouble, in comparison with many districts in other parts of the United States. The degree of infestation reported for the seven States concerned for the week ended July 27 is summarized as follows:

State	: Counties :	Animals :	Screw worm :	Infestation :
	infested:	examined:	infestations:	
	: <u>Number</u> :	: <u>Number</u> :	: <u>Number</u> :	: <u>Percent</u> :
Mississippi-----:	12	: 123,827 :	26	: 0.02
Georgia-----:	83	: 59,579 :	2,324	: 3.90
South Carolina-----:	10	: 6,408 :	29	: .45
Louisiana-----:	14	: 91,254 :	251	: .28
Alabama-----:	27	: 178,840 :	148	: .08
Florida-----:	48	: 193,119 :	6,548	: 3.98
Southeastern Texas---	19	: 37,554 :	592	: 1.56

In southwestern Texas ranchmen have reported that there has been little decrease in numbers of infestations during the last few weeks. Unusual amounts of rainfall, which necessitated late shearing, were probably responsible for a large number of these cases. Favorable weather conditions caused a prolongation of the usual season of the wool maggot fly (Phormia regina Meig.) and the infestations caused by

this species brought on attacks of the screw worm fly. Ranchmen in California and in southern Oklahoma report recent severe outbreaks of screw worm flies.

Oklahoma. O. G. Babcock and C. F. Stiles (August 30): The screw worm has been exceptionally abundant and destructive in western Oklahoma. In Carter, Jefferson, and Love Counties the average infestation of live-stock was reported to have reached 25 percent during the season. The infestation was less intense in the northern part of the State and ceased near the Kansas line.

New Mexico. W. B. Rogers (August 29): I learned from ranchers around Roswell that screw worms have been very prevalent there this season. Infestations as high as 90 percent were reported in some instances.

#### STABLE FLY (Stomoxys calcitrans L.)

Florida. W. V. King (August 27): An investigation along the beach in the vicinity of Panama City on July 24 to 26 showed that there was very little accumulation of Sargassum, a kind of brown marine algae. Decaying piles of these plants were prolific stable fly breeding places last fall. No adult flies were noted on or near the beach at the time the investigations were made this year.

Missouri. L. Haseman (August 24): The stable fly has been abundant during August.

#### EYE GNATS (Hippelates spp.)

Mississippi. J. P. Kisilanko (August 19): Eye gnats have been quite annoying in several southern counties for several weeks.

#### HORSES

##### HORSE FLIES (Tabanus spp.)

Missouri. L. Haseman (August 24): During the first half of the month horse flies continued to be abundant, although by August 20 they were becoming less troublesome.

Nebraska. M. H. Svenk (July 31): The lined horse fly (T. lineola Fab.) was reported as troublesome in Thurston County on July 19.

##### HORSE BOTFLIES (Gastrophilus spp.)

Iowa. R. W. Wells (August 27): G. intestinalis DeG. began ovipositing on laboratory horses at Ames on July 6. They have been very scarce, however, and not more than 50 or 60 eggs had accumulated on laboratory horses by July 31. Oviposition by G. nasalis L. was first observed on

July 1, about 3 weeks later than usual. The activity continued moderately for 4 or 5 days and was not observed after July 10. G. haemorrhoidalis L. was reported to be active at Ames during the first half of July.

North Dakota. J. A. Munro (August 21): Horse botflies continue to be troublesome over most of the State.

#### POULTRY

##### STICKTIGHT FLEA (Echidnophaga gallinacea Westw.)

Oklahoma. F. A. Fenton (August 20): The sticktight flea was reported as injurious to poultry in one locality.



# INSECT PEST SURVEY BULLETIN

---

Vol. 15

October 1, 1935

No. 8

---

## THE MORE IMPORTANT RECORDS FOR SEPTEMBER 1935

In the Great Plains region from North Dakota to Kansas, grasshoppers are numerous and weather conditions have been favorable for continued egg laying.

Further reports received during September confirmed the statement made in the last Survey Bulletin that the hessian fly is generally serious in the Eastern and East Central States.

The corn ear worm is normal to subnormal over the Eastern States, with serious damage reported to tomatoes in the Great Basin and the Pacific Northwest.

The corn leaf aphid is exceedingly abundant in the East Central States.

Sugarcane borer populations in the cane fields of Louisiana are said to be the lowest they have been in the past 25 years.

Codling moth damage in the Eastern States is comparatively low. High temperatures during the first part of the month, however, resulted in a decided increase in the amount of wormy fruit in the Pacific Northwest.

The flat-headed apple tree borer is decidedly more troublesome than usual from Indiana westward to Nebraska, Kansas, and Oklahoma.

The oriental peach moth was reported as doing some damage in the southern part of New Hampshire. It also attracted attention throughout the Middle Atlantic and East Central States. The insect was found for the first time in the vicinity of St. Joseph, Mo.

The vegetable weevil was reported injuring turnips during the third week in September in Mississippi. This is unusually early for this insect to be troublesome.

The Mexican bean beetle was reported during the month from Caledonia and Chittenden Counties, Vt. These are new northern records for the distribution of this pest.

The fall webworm is generally prevalent throughout the New England and the East Central States. We also have reports of webworm damage from Texas and Colorado.

An unusual and serious infestation of jack pine by a scarabaeid beetle (*Pachystethus olivia* Horn) is reported from Michigan, the beetles defoliating the pines.

#### THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA FOR SEPTEMBER 1935

In central Manitoba the hot, wet weather of June and July started a fungous disease which killed off most of the grasshoppers. The cold autumn has reduced the egg-laying period in that Province. In the Red River Valley, however, grasshoppers laid enough eggs to constitute a menace in 1936. Some trouble may also develop in southwestern areas of the Province. In Saskatchewan grasshoppers forced the early cutting of wheat and oats rather generally in southern and central districts, but losses on the whole were moderate. A preliminary survey of grasshopper abundance in the autumn indicates that a considerable outbreak is again in prospect for 1936. In Alberta some fields showed from 10 to 80 percent of wheat heads on the ground as a result of grasshopper attacks; oats and barley also suffered, largely due to lack of early season poisoning.

A marked reduction in the numbers of the common field cricket compared with 1934 is reported in the Prairie Provinces.

Wireworms are considered the most serious problem affecting wheat production in the Peace River and adjacent agricultural areas of Alberta and British Columbia.

Damage by the wheat stem sawfly is greater than usual in prairie districts of Saskatchewan where the crop is not badly rusted. Losses from this insect in some parts of southern Alberta ranged from 5 to 30 percent of the crop.

Damage by the wheat stem maggot in southern Manitoba is considerably less than last year, but in a few places ranged as high as 3 percent.

Reports from New Brunswick, Ontario, and the Prairie Provinces appear to indicate an increased intensity of infestation of the Colorado potato beetle.

The imported cabbage worm was unusually abundant in Ontario. Severe damage was also reported in parts of Saskatchewan and British Columbia.

The red turnip beetle is reported to be normally one of the worst pests of turnips, sweet alyssum, and allied plants in the Peace River area of Alberta and British Columbia. Infestations appear to have been particularly severe during 1934 and 1935.

Scattered reports and observations indicate that Say's stink bug is becoming distributed over southern Alberta. It was first found in the Chin area, in the spring of 1935. Its hosts are wheat and mustard.

There is a heavy infestation of chinch bugs affecting lawns and meadow grasses in Halifax and Yarmouth Counties, Nova Scotia, and probably generally throughout the Province. Many lawns and grass plots have been almost completely destroyed.

Increased abundance of gladiolus thrips as compared with 1934 is reported to be general in Ontario.

Many complaints regarding the European earwig have been made in the Pacific coast area of British Columbia and on Vancouver Island. The parasite Digonichaeta setipennis Fall. has become established in certain localities.

A marked reduction in the numbers of the gray-banded leaf roller has occurred in the Annapolis Valley, Nova Scotia, probably largely owing to natural control factors.

Injury by the codling moth in the Niagara district, Ontario, is much less severe than in 1934.

The oriental fruit moth is much less abundant in the Niagara district than last year.

The blunt-nosed leafhopper was found to be present in all wild cranberry bogs south of Annapolis Royal, Nova Scotia. This insect is a carrier of false blossom disease of cranberries.

The European spruce sawfly has been found in Cumberland and Pictou Counties, Nova Scotia. In Quebec the species has been found generally distributed between the St. Lawrence and Saguenay Rivers, and at localities extending to the western boundary of the Province. It is also doubtfully recorded at Oba, in northern Ontario.

Larvae of the black-headed budworm were more numerous than last year, on fir and spruce, in the Maritime Provinces and the Gaspé Peninsula, Quebec.

A severe infestation of the white-marked tussock moth was reported in New Brunswick and Nova Scotia.

Trees continue to die throughout Nova Scotia as a result of injury by the balsam woolly aphid, and the total loss in mature stands is considered probably about 50 percent. Many large stands have been practically destroyed.



The wharf borer, Nacertas melanura L., has been reported causing serious damage to piling in the harbour of Saint John, New Brunswick. This species has been recorded from certain localities in the Provinces of Nova Scotia, Quebec, Ontario, and Manitoba.

The paralysis tick is more numerous than normal in certain sections of southern Alberta. A fatal case of Rocky Mountain spotted fever, which is carried by this species of tick, occurred in the Manyberries section, and appears to be the first authentic case reported from the Province.

Wasps have been a very numerous and troublesome pest on Vancouver Island, British Columbia.

Specimens of the black widow spider have been taken locally in the Victoria district.

## GENERAL FEEDERS

## GRASSHOPPERS (Acrididae)

Illinois. R. C. Hall (September): An unusual infestation of grasshoppers was observed on August 6 in a young planting of white and pitch pine at Bath. In one area where these two species had been planted about 75 percent had been killed by these insects. The damage was caused by defoliation and by the pruning and girdling of small branches. Some trees were pruned down so that only a single naked leader remained. Four species were collected, Melanoplus angustipennis Dodge, Schistocerca alutacea Harr., Spharagemon collare Scudd., and Psinidia fenestralis Serv.

North Dakota. F. D. Butcher (September 21): Bright, warm days during late August and September were favorable for continued egg laying. Adults of Camnula pellucida Scudd. have practically disappeared, but their eggs are in the ground. Adults of other species on pastures and range in western North Dakota are numerous in some places. M. differentialis Thos. is making a successful comeback in the southwestern part of the State.

South Dakota. H. C. Severin (September 20): Range species of grasshoppers have increased enormously in numbers over much of the western two-thirds of South Dakota. Grasshoppers attacking cultivated crops were chiefly M. bivittatus Say, M. mexicanus Sauss., and Dissosteira carolina L. Damage was spotted in gardens, small grains, alfalfa, sweetclover, flax, and corn.

Iowa. H. E. Jaques (September 24): Grasshoppers are unusually abundant throughout much of the State. M. differentialis and M. femur-rubrum DeG. predominate. Some of the rarer species are rather easily found.

Kansas. H. R. Bryson (September 25): Grasshoppers occur in considerable abundance in some localities. The species most commonly encountered are M. differentialis, M. bivittatus, M. mexicanus, and M. femur-rubrum.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Texas. F. L. Thomas (September 16): Fall armyworms, two-thirds grown, were assuming the army habit on Bermuda lawns at College Station, Bryan, and Navasota on September 11. Eggs were laid about the first of September and pupation is taking place at the present date. Parasites are present but not sufficiently abundant to prevent the appearance of another generation.

CLOUDLESS SULPHUR (Catopsilia eubule L.)

South Carolina. C. C. Bare (September 13): A distinct migration of this butterfly was observed at the Truck Experiment Station at Charleston from 2 to 3 p.m. on September 13. The afternoon was cloudy, the temperature during the flight was 78° F., and the relative humidity was 67

percent. The direction of the flight was toward the southwest and coincided with that of a slight breeze. During the hour after the migration was first noticed, nearly 100 butterflies were seen flying at a height of 4-10 feet across a 2-acre field, 31 being counted during the first 10 minutes. The flight was stopped by darkening of the sky due to a local shower. A few butterflies sought shelter in clumps of bamboo.

Haiti. A. Audant (June 20): We have noticed the first flight in Port-au-Prince, going toward the east.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT

#### HESSIAN FLY (Phytophaga destructor Say)

Indiana. H. R. Painter and W. B. Noble (September 23): Hessian fly infestation has increased considerably this season, favored by the rather abundant growth of volunteer wheat. All stages of larvae as well as puparia are present in volunteer. Parasitization is likewise on the increase. In the vicinity of La Fayette the degree of parasitization of the summer puparia is about 75 percent. Unless unfavorable conditions next spring check development serious damage may be expected.

Ohio. T. H. Parks (September 28): Volunteer wheat carries a plentiful supply of eggs. Very little wheat has been sowed anywhere in the State. There is plenty of volunteer wheat, however, to carry over a heavy fall brood.

Nebraska. M. H. Swenk (September 15): The hessian fly abundance is at a very low ebb.

#### WHEAT STEM MAGGOT (Meromyza americana Fitch)

South Dakota. H. C. Severin (September 20): Wheat stem maggot damage ranged from 5 to 27 percent, chiefly to wheat and barley.

### CORN

#### CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton and A. C. Cole, Jr. (September 23): A few second-brood adults in cornfields in Tippecanoe County have reached maturity. Numbers of bugs in bunch grasses have gradually increased since August 29, the date they were first found. This date apparently marks the initial entrance of bugs into hibernation quarters. Their appearance first in clumps of Elymus spp. indicates an apparent preference for the drier grasses. Adult females fail to show the presence of eggs but are storing up fat. Bugs in a few cornfields are rather heavily infested with a fungus.



Illinois. W. P. Flint (September 20): In the west-central and northwest-central parts of Illinois, and also to some extent in the southeast-central area, chinch bugs are developing in corn and grass in small grain stubble in sufficient numbers that we may expect rather serious abundance next year.

Kansas. H. R. Bryson (September 25): Chinch bugs may be found readily on sorghums at Manhattan, but are not doing any damage.

#### COLORADO CORN ROOT WORM (Diabrotica virgifera Lec.)

Nebraska. M. H. Swenk (September 15): From Keith County on August 22 came the report of the Colorado corn root worm affecting corn.

#### EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. N. Turner (September 21): Late sweet corn had 55 percent corn borer infested ears. About 75 percent of the ears were damaged by either ear worms or corn borers.

Virginia. H. G. Walker (September 26): Several fields were examined about July 25 but no eggs were found. Pupae were reported as being rather abundant in the fields during the middle of August. On August 27 and 28 many egg masses were present, some of which had just been laid and others were hatching. Thirty egg masses, 13 of which had hatched, were found on the 30 stalks examined in one field. As many as 25 borers were found in 1 stalk, varying in size from newly hatched to full-grown larvae. This indicates very strongly that there is at least a partial third generation.

#### CORN LEAF APHID (Aphis maidis Fitch)

Indiana. J. J. Davis (September 23): The corn leaf aphid was again reported early in the month as being exceedingly abundant on corn, especially on the tassels, and damaging corn in a number of localities in central Indiana.

Illinois. W. P. Flint (September 20): The corn leaf aphid has been very abundant throughout central Illinois. At the present time it is being rapidly reduced by parasites.

#### ALFALFA

#### GREEN CLOVER WORM (Plathypena scabra Fab.)

Kansas. H. R. Bryson (September 20): The green clover worm is very abundant in alfalfa fields, the population having approximated outbreak proportions in the eastern part of the State. An appreciable amount of damage has occurred in fields where the population is greatest.

SORGHUMSORGHUM WEBWORM (Celama sorghiella Riley)

Texas. H. J. Reinhard (September 12): Extensive injury to small grain crops by the sorghum worm was noted on September 12. Grain in the dough stage showed infestations ranging as high as 168 worms per sorghum seed head.

COWPEASLESSER CORN STALK BORER (Elasmopalpus lignosellus Zell.)

South Carolina. W. C. Nettles (September 18): The lesser corn stalk borer has destroyed many acres of cowpeas and soybeans in the central portion of the State on light, sandy soils. O. L. Cartwright reported the lesser corn stalk borer in sorghum and field peas at Florence.

CROTALARIABELLA MOTH (Utetheisa bella L.)

Florida. J. R. Watson (September 23): Caterpillars of the bella moth are very abundant and doing considerable damage to pods of crotalaria.

Mississippi. H. Gladney (August 31): Larvae were feeding on crotalaria at Ocean Springs on August 31.

SUGARCANESUGARCANE BORER (Diatraea saccharalis Fab.)

Louisiana. W. E. Hinds (September 25): Sugarcane borers are less numerous than at any time during the past 25 years, at this season of the year. Seed cane free from infestation has been planted more generally. Infested top trash, in which the major part of the population in hibernation is likely to overwinter successfully, has been more generally and effectively burned during the winter. Heavily infested areas of early corn have been so disposed of as to prevent the emergence of large numbers of first-generation moths therefrom. Sugarcane dead-hearts, caused by first-generation larvae as they become full-grown, have been cut out and the larvae and pupae destroyed. The use of Trichogramma parasites has been greatly increased. These factors are added to the very important control effected by a prolonged period of rain and freezing weather which occurred during the latter part of January 1935.

## FRUIT INSECTS

APPLECODLING MOTH (Carpocapsa pomonella L.)

New York. P. J. Parrott (September 27): Less than 5 percent of the fruit infested, on the average, in the eastern fruit districts.

Ohio. T. H. Parks (September 26): No serious injury has occurred in orchards that received three cover sprays following the calyx-cup application. Counts of worm-blemished fruit in orchards of cooperators show that codling moth stings rarely occur on more than 5 percent of the fruits. The best orchards carry 92 to 96 percent clean fruit, with scab being the most common blemish. Most of the codling moth stings and entrances were made during September. Self-working bands have trapped only very few larvae during the season.

Illinois. W. P. Flint (September 20): The warm weather during mid-September has induced emergence of codling moths that pupated before the cool period in the latter part of August. At the present time there are rather large numbers of moths in most of the central and northern Illinois orchards.

South Dakota. H. C. Severin (September 18): One complete and one partial generation in South Dakota. In some sections 100 percent of the fruit was infested in unsprayed trees.

Washington. E. J. Newcomer (September 19): Unusually hot weather during the first 10 days of September has resulted in a considerable increase in the amount of wormy fruit in the Yakima and Wenatchee Valleys. This increase seems to be particularly noticeable in orchards that had not been very thoroughly sprayed earlier.

FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Indiana. J. J. Davis (September 23): The flat-headed borer has been frequently reported from all parts of the State as destructive to hard maple and apple.

Nebraska. M. H. Swenk (September 15): During the period from August 15 to September 15 a great many complaints of injury to fruit and shade trees, especially apple, elm, maple, and oak, were received.

Kansas. H. B. Hungerford (September 7): The flat-headed apple tree borer is doing much damage to nursery stock this year. It is also unusually injurious to orchards in southern Kansas.

Oklahoma. F. A. Fenton (September 23): Reports have been received from all parts of the State requesting information on fruit and shade tree borer control, the chief culprit being the flat-headed apple tree borer, which is probably more injurious in Oklahoma this year than usual.



## PLANT BUGS (Miridae)

Connecticut. P. Garman (September 23): Evidence of the work of various species of plant bugs is conspicuous on peaches and pears, and to some extent on apples. Damage is general over the State but worse in a few localities. The species involved are Lygus pratensis L., Neolygus invitatus Say, N. quercalba Knight, and possibly N. caryae Knight. Damage in many orchards is worse near brushland, but may be distributed, though less severe, over the entire planting.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

New York. R. E. Horsey (September): Quite abundant on two small shrubs of glossy buckthorn (Rhamnus frangula) with crawling young on August 29. Noted on cotoneaster on August 27.

Illinois. W. P. Flint (September 20): The San Jose scale is decidedly on the increase in north-central and northern Illinois.

PEACHORIENTAL PEACH MOTH (Grapholitha molesta Busck)

New Hampshire. L. C. Glover (September 24): The oriental peach moth has been doing some damage in peach orchards in the southern part of the State. Unofficially, it has been known to be present in New Hampshire for at least 2 years. The exact date of entry is unknown.

New York. P. J. Parrott (September 27): About 6 percent of the fruit was infested in western New York.

Ohio. T. H. Parks (September 28): Larval injury was very light to our heavy crop of Elberta peaches in central and northern Ohio. Later varieties now maturing are not seriously damaged. Quinces are almost all ruined now by the insect.

Georgia. O. I. Snapp (September 20): Of 20,222 Elberta peaches cut open and examined, only 1 was found to be infested with the oriental fruit moth. These peaches were harvested from an orchard in which no control measures against the moth were used. The insect is of no economic importance in this region. This favorable situation is attributed to the absence of a host for the hibernating broods of larvae.

Missouri. H. G. Butler (September 11): An oriental fruit moth emerged this morning from a larva collected on August 22 in a peach twig in an orchard 1/2 mile northeast of Saint Joseph. Typical twig injury is fairly abundant in this orchard, but as Anarsia lineatella Zell. larvae were also present, rearing was required to establish the presence of G. molesta.

PEACH BORER (Aegeria exitiosa Say)

New York. P. J. Parrott (September 27): Very abundant.

Georgia. O. I. Snapp (September 20): The peak of moth emergence in peach orchards at Fort Valley occurred this year between September 5 and 10, which is somewhat earlier than usual. Moth emergence will be practically completed by September 30. Field mice and rats have destroyed many pupae in commercial peach orchards.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Connecticut. P. Garman (September 23): Fruit in general over the State appears to be unusually free from attack of this insect.

Ohio. T. H. Parks (September 28): Injury is very light to both stone fruits, pears, and apples. It was quite uncommon to find cherries or peaches infested. Feeding and egg-laying scars are very scarce on apples.

Georgia. O. I. Snapp (September 20): The plum curculio is now leaving peach trees and migrating to places of hibernation.

T. L. Bissell (September 25): On September 21 jarred 7 large peach trees at Experiment and got 7 adults of C. nenuphar, apparently recently emerged. On September 18 jarred 1 weevil from a pecan tree.

PEARQUINCE CURCULIO (Conotrachelus crataegi Walsh)

Connecticut. W. E. Britton (September 23): Specimens in the fruit of pear have been received from Guilford and Woodstock.

PEAR SLUG (Eriocampoides limacina Retz.)

New York. R. E. Horsey (September): Numerous cherry, pear, English hawthorn, cotoneaster, etc., in and near Rochester were noted this month to be badly injured by this slug. Several trees had their leaves completely skeletonized. Feeding was observed as late as September 21.

RASPBERRYRASPBERRY CANE BORER (Oberea bimaculata Oliv.)

Indiana. J. J. Davis (August 28): Raspberry cane borer reported exceedingly abundant and apparently destructive to raspberry at Fort Wayne.

COMMON RED SPIDER (Tetranychus telarius L.)

Colorado. G. M. List (September 21): The common red spider was very injurious, especially to raspberries, in eastern Colorado during July and August.

GRAPEGRAPE LEAFHOPPER (Erythroneura comes Say)

Nebraska. M. H. Swenk (September 15): A Merrick County correspondent reported his grapevines being infested with the grape leafhopper on August 27 and a Dawson County correspondent made a similar complaint regarding his woodbine vines on September 14.

Utah. G. F. Knowlton (September 19): Grape leafhoppers are seriously damaging grape and Virginia creeper foliage.

California. B. L. Fox (September 5): The grape leafhopper is doing a moderate amount of injury to grapevines locally, but the injury is not sufficient to warrant control measures this late in the season.

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. T. H. Parks (September 28): Infestation varies greatly in the commercial vineyards along Lake Erie. Last week I found one vineyard with fully 40 percent of the grapes ruined, while others in the same general neighborhood were not seriously infested. Accurate counts made in one vineyard that had received two sprays showed that from 12 to 16 percent of the berries were infested.

PECANFALL WEBWORM (Hyphantria cunea Drury)

Georgia. O. I. Snapp (September 6): The fall webworm is more abundant than usual at Fort Valley. There are many nests in pecan trees and the larvae have eaten many leaves on some trees.

Mississippi. C. Lyle and assistants (September 23): The second generation of the fall webworm is rather generally distributed over Mississippi, although the infestations are not nearly as heavy as in some years. No very extensive defoliation of pecans and persimmons has occurred.

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Oklahoma. F. A. Fenton (September 23): During the middle to the last part of the month there was an infestation of the walnut caterpillar. Heavy defoliation of pecan trees resulted.

PECAN WEEVIL (Curculio caryae Horn)

Georgia. T. L. Bissell (September 7): Emergence started on July 17 at Experiment, which is about normal and 2 weeks earlier than in 1934. Emergence was at a peak August 19. The total damage promises to be low this year, though the short crop of Stuarts will probably be well infested.



CITRUSCITRUS WHITEFLY (Dialeurodes citri Riley & How.)

Florida. J. R. Watson (September 23): The fall brood of whiteflies is on the wing, a little later than usual and in about normal numbers.

Mississippi. C. Lyle (September 23): A very heavy flight of whiteflies was reported at Hattiesburg on September 11. These insects were also reported very abundant at Wiggins by inspector J. P. Kislanko September 10 and by inspector G. L. Bond at Moss Point.

## T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Gyll.)

Mississippi. M. L. Grimes (September 21): Injury to turnips has been observed at Meridian. This is rather early for such injury.

## BLISTER BEETLES (Meloidae)

South Carolina. W. C. Nettles (September 18): Specimens of blister beetles (Epicauta pennsylvanica DeG.) were submitted from soybeans, tomatoes, and late Irish potatoes late in August.

Florida. J. R. Watson (September 23): The blister beetles, especially E. vittata Fab., are troublesome to tomatoes, peppers, and eggplants.

Mississippi. C. Lyle and assistants (September 23): E. lemniscata Fab. was abundant in Tate County and E. cinerea marginata Fab. was damaging eggplants in Rankin County on September 11.

South Dakota. H. C. Severin (September 18): Much damage done to most garden crops, potato, alfalfa, sweetclover, and caragana and ash trees in the western two-thirds of South Dakota by many species of blister beetles, but is not as severe as in 1934.

STRIPED FLEA BEETLE (Phyllotreta vittata Fab.)

Louisiana. W. E. Hinds (September 25): Adults have been exceedingly abundant on young mustard and turnips.

CARROT BEETLE (Ligyrus gibbosus DeG.)

Washington. R. S. Lehman (September 21): Adults are cutting off the roots of lettuce plants at Walla Walla. The extent of the damage is about 3 to 5 percent and is much greater than in previous years. Practically all lettuce fields in this locality show some damage as a result of feeding.

California. R. E. Campbell (September 20): This insect is reported to be

injuring egg plants in the Coachella Valley. The adult burrows into the soil in the daytime and cuts off the stem of the young plant about an inch below the surface.

#### A PLANT BUG (Pycnoderes quadrimaculatus Guer.)

Arizona. C. D. Lebert (September 16): At Phoenix the squash capsid P. quadrimaculatus has been giving some trouble on various cucurbits and especially on gourds that are grown for ornamentals.

#### FALSE CHINCH BUG (Nysius ericae Schill.)

South Dakota. H. C. Severin (September 18): Sent in repeatedly with complaints of damage to gardens and small fruits.

#### TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Virginia. H. G. Walker (September 26): The turnip aphid has been rather seriously injuring fields of kale in the Norfolk area.

#### CABBAGE WEBWORM (Hellula undalis Fab.)

South Carolina. W. C. Nettles (September 18): Numerous reports of serious damage to collards, cabbage, and turnips have been received from the Piedmont section.

Georgia. T. L. Bissell (September 20): Cabbage webworms are injuring the tops of turnips and Chinese cabbage at Experiment.

Mississippi. C. Lyle and assistants (September 23): The garden webworm was causing serious injury on September 16 in fall gardens in Jones and Oktibbeha Counties.

#### MOLE CRICKETS (Scapteriscus spp.)

Florida. J. M. Tenhet (September 20): Mole crickets (mostly S. acletus Rehn & Hebard and some S. vicinus Scudd.) are very injurious on celery seed beds at Sanford. Infestation is very spotted. Some seed beds are very heavily infested while other beds in the same vicinity are almost uninjured.

#### POTATO AND TOMATO

##### CORN EAR WORM (Heliothis obsoleta Fab.)

Connecticut. M. Turner (September 21): About 30 percent of the ears from late corn at Mount Carmel is infested by second-generation larvae.

South Carolina. W. C. Nettles (September 18): The corn ear worm has been reported from many points over the State damaging buds of corn plants.

- Indiana. E. V. Walter (September 23): Corn ear worms have continued rather scarce at La Fayette, with infestation averaging about 4 percent in all corn coming into silk prior to September 1. Adults appeared in somewhat larger numbers during the first week of September than previous to that date and late corn is somewhat more heavily infested.
- South Dakota. H. C. Severin (September 18): Last year we estimated that 15 percent damage was done to ear corn. The damage this year is slightly less.
- Mississippi. M. L. Grimes (September 23): Much injury to late tomatoes and corn at Meridian.
- Louisiana. W. E. Hinds (September 25): Larvae have caused some damage to soybean seed in some localities by eating into the pods and feeding upon the seed.
- Colorado. G. M. List (September 21): The corn ear worm has been less numerous this season than last. Comparatively little injury has occurred to tomatoes, with only moderate injury to corn. Early sweet corn in Adams, Arapahoe, and Weld Counties was injured worse than the late corn.
- Utah. G. F. Knowlton (September 13): Corn ear worm damage has been unusually severe to sweet corn and moderately severe to tomatoes in many localities.
- Washington. E. J. Newcomer (September 25): A very serious outbreak of the tomato fruit worm has occurred on tomatoes in the Yakima Valley, in some plantings 75 or 80 percent of the tomatoes being wormy. Although a common pest of corn for years here, the insect has apparently not previously caused much damage to tomatoes.
- California. A. E. Michelbacher (September 21): A survey of the damage caused to tomatoes from Oakland to San Jose showed that the amount of infested fruit ranged from 5 to 40 percent. The heaviest infestations were found about San Jose. A like survey made from Walnut Creek to Pleasanton showed the infestation to range from less than 5 to about 15 percent. On the whole, the infestation was found to be extremely light.

#### TOMATO WORM (Phlegethontius sexta Johan.)

- Maine. H. B. Peirson (August 1-20): Larvae of the tomato hornworm are commonly reported in central Maine.

#### TORACCO FLEA BEETLE (Epitrix parvula Fab.)

- California. R. E. Campbell (September 19): A. F. Howland reports E. parvula concentrating on an occasional tomato plant in the San Pedro-Long Beach area. Plants so attacked are noticeably stunted. J. C. Elmore reports similar damage to tomatoes in southern Orange County, with especial



damage to lower leaves, but little commercial damage. (This is the species of Epitrix to which Mr. Elmore referred on page 342 of the September issue of the Insect Pest Survey Bulletin.)

#### TOMATO STILT BUG (Jalysus spinosus Say)

Nebraska. M. H. Swenk (September 15): Reported as feeding on the buds and blossoms of tomato vines in Hall County on August 26.

#### TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Colorado. G. M. List (September 21): The tomato psyllid has been less numerous than normally on tomatoes in northern Colorado. The early infestation was rather severe in the Arkansas Valley but did not continue throughout the season. The potato infestation has been about normal, with spraying being followed out more generally than ever before. Probably 60 percent of the potatoes of the State have been sprayed.

#### BEANS

##### MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

Vermont. H. L. Bailey (September 24): Discoveries of the Mexican bean beetle in moderate numbers at Ryegate in Caledonia County, and at Burlington in Chittenden County, make new northern records for distribution in Vermont.

Virginia. H. G. Walker (September 26): A correspondent living in the Dismal Swamp about one-fourth of a mile from Lake Drummond reports that the Mexican bean beetle has never been found on his beans and he has been growing beans for many years.

Indiana. J. J. Davis (September 23): Mexican bean beetle continues as the major garden pest, reports of abundance and damage coming from every section of the State and from many districts where it has not been abundant heretofore.

New Mexico. W. B. Rogers (August 31): The Mexican bean beetle is devouring the bean crop in the Roswell section.

Utah. G. F. Knowlton (September 17): Mexican bean beetles are seriously damaging pole beans at Santa Clara.

##### BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Mississippi. C. Lyle and assistants (September 17): The banded cucumber beetle is present in large numbers on turnips at Philadelphia.

Louisiana. W. E. Hinds (September 25): Extremely abundant on late crop of snap beans and on other garden crops.

A BEAN BEETLE (Cerotoma sp.)

Arizona. C. D. Lebert (September 16): A bean beetle identified as Cerotoma sp. completely destroyed 15 acres of beans near Phoenix. This pest was responsible, earlier this season, for a great percentage of "drop" on tomato vines. It has been confused by many of the farmers with Ceratomyza fuscilabris Muls., one of our common ladybeetles. They are similar in size and coloration to some extent.

GREEN STINK BUG (Acrosternum hilaris Say)

Vermont. H. L. Bailey (September 24): A local outbreak of the green stink bug was reported from Huntington in Chittenden County, where it seriously damaged beans. The presence of this insect in outbreak numbers has been extremely rare in Vermont.

CABBAGE

## CABBAGE INSECTS (Lepidoptera)

North Carolina. C. O. Bare (August 10-15): The cross-striped cabbage worm (Evergestis rimosalis Guen.) was severely damaging 10-20 percent of the plants in 10 cabbage fields between the Great Smokies and Mount Mitchell. It was nearly as abundant as the imported cabbage worm (Ascia rapae L.), and more abundant than the cabbage looper (Autographa brassicae Riley), in the same fields. No larvae of the diamond-back moth (Plutella maculipennis Curt.) were associated with it. While the cross-striped cabbage worm is the principal pest of cabbage at Charleston, it has not been observed at all in that section.

IMPORTED CABBAGE WORM (Ascia rapae L.)

South Dakota. H. C. Severin (September 19): Very abundant, attacking cabbage and cauliflower throughout the State.

California. R. E. Campbell (September 20): Cabbage worms are numerous enough to require control measures in practically all fields of fall cabbage and cauliflower in southern California.

CABBAGE LOOPER (Autographa brassicae Riley)

New York. P. J. Parrott (September 27): The cabbage looper is fairly abundant in some localities.

Kansas. H. R. Bryson (September 26): Abundant on lettuce sown in fall gardens.

Colorado. G. M. List (September 21): The cabbage looper has been more abundant than usual in a number of sections of the State. During August considerable damage was done to potatoes in Weld County. It was necessary to spray a large acreage for control.

### HARLEQUIN BUG (Murgantia histrionica Hahn)

Mississippi. C. Lyle and assistants (September 19): Severely damaging cabbage and collards in Jones and Forrest Counties.

### CABBAGE APHID (Brevicoryne brassicae L.)

Indiana. J. J. Davis (September 23): Reported as excessively abundant on cabbage and kale from a number of southern localities.

South Dakota. H. C. Severin (September 18): Cabbage, including red cabbage, is being badly infested by cabbage aphid.

### CUCUMBER

#### STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

Florida. J. R. Watson (September 23): The striped cucumber beetle was picked up in Alachua County. It is the second time it has been noticed in that part of the State.

Mississippi. C. Lyle and assistants (September 23): The striped cucumber beetle has caused considerable damage to late watermelons at Senatobia and State College.

#### SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

Kansas. H. R. Bryson (September 26): The adults are more abundant in Kansas than last year.

### MELON APHID (Aphis gossypii Glov.)

Kansas. H. R. Bryson (September 26): Aphids have been quite abundant and have done considerable injury to late squashes, cucumbers, and melons. Ladybeetles and their larvae have been quite active, but are not present in sufficient numbers to hold the infestation in check.

### PEPPER

#### PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (September 23): Following the total destruction of all pepper fields in Manatee County, the pepper weevil is extremely scarce.



## COTTON INSECTS

BOLL WEEVIL (*Anthonomus grandis* Boh.)

- North Carolina. C. H. Brannon (September 25): From North Carolina Cotton Report, September 1: "Weevils have probably caused most of the damage to cotton this year in North Carolina. The top crop is almost entirely missing as a result. The July or middle crop is only fair. The bottom crop is unusually good in almost all parts of the State."
- South Carolina. W. C. Nettles (September 18): Very severe damage reported to bolls throughout the State during August.
- Mississippi. C. Lyle and assistants (September 23): Boll weevils are reported in large numbers in cotton fields at this time. Due to recent rains, cotton is putting on a large number of squares and there is every indication that a large population of weevils will go into hibernation.
- Louisiana. W. E. Hinds (September 25): Boll weevils are breeding very abundantly in the second growth of cotton following the maturing of the bolls, and in many instances the defoliation by leaf worms (*Alabama argillacea* Hbn.).
- Oklahoma. C. F. Stiles (September 21): The boll weevils are generally distributed from Jefferson, Stephens, and Grady Counties eastward. The heaviest infestation is not so heavy as it usually is for this time of the year.
- Texas. H. J. Reinhard (September): Late planted crops suffered from injury by this insect during August and September.

COTTON LEAF WORM (*Alabama argillacea* Hbn.)

- District of Columbia. R. C. Althouse (September 24): A great number of moths were observed on the streets and sidewalks of Washington at noon on September 24.
- Virginia. H. G. Walker (September 26): The cotton leaf worm has been reported as defoliating several fields of cotton around Norfolk. One field was examined today which was almost completely defoliated and the larvae were marching like armyworms in search of more food.
- North Carolina. R. W. Leiby (September 9): Cotton leaf worm reported as destroying a total of several hundred acres of cotton in Halifax and Hyde Counties.
- South Carolina. W. C. Nettles (September 18): Large numbers of cotton leaf worm moths in trap lights at Clemson College.
- O. L. Cartwright (September 18): Cotton leaf worm damage not serious at Florence.

Georgia. O. I. Snapp (September 20): The cotton leaf worm has been very abundant at Fort Valley and some fields of cotton are now completely stripped.

T. L. Bissell (September 24): The cotton leaf worm has practically stripped all cotton at the station at Experiment, but no harm is done as the cotton has matured.

Mississippi. C. Lyle and assistants (September 23): The cotton leaf worm is very generally distributed over Mississippi. Infestation in most instances has been rather light and poisoning has been necessary in only a few places. The early maturity of cotton largely prevented serious damage.

Louisiana. W. E. Hinds (September 25): Cotton leaf worms have stripped nearly all cotton in the State, except where poisoned. Stocks of arsenicals were exhausted early in August. The damage done by stripping is quite heavy.

Missouri. G. D. Jones (September 17): The cotton leaf worm situation has improved somewhat and we do not expect any serious losses when the second wave strikes.

Oklahoma. C. F. Stiles (September 21): The cotton leaf worm has defoliated 90 percent of the cotton in the lowlands in the eastern half of the State. Much of the upland cotton has suffered very little. For awhile during the first week in September the cool nights checked the activity of the worms in the vicinity of Stillwater; however, for the past week the weather has been unusually warm and worms are showing up in large numbers.

Arizona. C. D. Lebert (September 15): The farmers have been dusting for the cotton leaf worm in the Tucson area recently.

T. P. Cassidy (September 7): The second generation of worms has pupated at Sawyer Ranch. If the present generation of pupae is not heavily parasitized, some damage will be experienced. However, this is the heaviest infestation noted in the Tucson district.

Texas. K. P. Ewing, R. L. McGarr, et al. (September 7): A new generation of worms is beginning to show up in some sections of Calhoun County. A little poisoning has already been done in some of the late cotton.

Texas and New Mexico. D. M. McEachern (September 21): Farmers throughout the Pecos Valley of Texas and New Mexico and the Big Bend section of Texas are continuing to apply poison to control the cotton leaf worm. So far the insect has been held in check and there is no appreciable damage.

#### BOLL WORM (Heliothis obsoleta Fab.)

South Carolina. O. L. Cartwright (September 18): Worms damaging cotton

bolls in late cotton at Florence.

Oklahoma. C. F. Stiles (September 21): Boll worm damage so far has been light, with the exception of some rank cotton in the eastern part of the State.

Texas. H. J. Reinhard (September 21): The third generation of this insect on cotton caused some injury to late crops during the second week of September.

#### PINK BOLL WORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (September 7): Pink boll worm infestation counts in seven fields at Presidio averaged 48.43 percent. The infestation is increasing quite rapidly now.

Mexico. C. S. Rude (September 3): Infestation in the States of Durango and Coahuila runs from 70 to 100 percent.

#### COTTON FLEA HOPPER (Psallus seriatus Reut.)

Mississippi. E. W. Dunnam and T. T. Carter (September 7): Late cotton in Washington County is being damaged by the flea hopper.

Oklahoma. C. F. Stiles (August 20): Flea hoppers are still doing enormous damage throughout the eastern half of the State.

Arizona. T. P. Cassidy (August 24): Cotton flea hoppers were found in three cotton fields in the Marana district of Pima County on August 19 and 21, by H. G. Johnson. A total of 19 hoppers were collected in 300 sweepings with a standard net. Records made in the Flowing Wells, Midvale, and Saluarita areas and at Sawyer Ranch were negative. While the hopper has been known to occur on croton in the Tucson district for several years, this is the first record of it being found on cotton.

Texas. H. J. Reinhard (September 20): This insect is multiplying rapidly on croton. An average of about 300 adults were taken to 25 sweeps of an insect net.

R. Malirn (August 22): The county agent reports that the cotton flea hopper is very abundant throughout Dallas County.

### FOREST AND SHADE - TREE INSECTS

#### FALL WEBWORMS (Hyphantria spp.)

New England. E. P. Felt (September 23): A fall webworm, H. textor Harr., has been moderately prevalent in southwestern New England and noticeably more abundant 20 miles north of Long Island Sound.



J. V. Schaffner, Jr. (September 27): Reports indicate that H. cunea Drury is generally common throughout most of New England, but less abundant than 1 year ago. Locally abundant in the vicinity of Marlboro, Mattapoisett, and Sandwich, Mass.

Connecticut. W. E. Britton (September 23): Nests are common in the north-eastern section of the State but only an occasional nest is seen elsewhere. Much less abundant than for several years.

Ohio. E. W. Mendenhall (September 4): The fall webworm is quite numerous on apple trees in central Ohio.

Indiana. J. J. Davis (September 23): The fall webworm has been unusually abundant throughout the State, elm and boxelder being most commonly attacked.

Illinois. W. P. Flint (September 20): The fall webworm has been unusually abundant throughout the State, probably present in greater numbers than at any time for the past 5 years.

Tennessee. G. M. Bentley (September 26): Generally abundant throughout the State attacking a wide list of host plants.

Nebraska. M. H. Swenk (September 30): The fall webworm (H. cunea) was working on elm trees in Hitchcock County on September 17.

Texas. D. M. McEachern (September 21): The fall webworm has been observed at Balmorhea, principally on cottonwood.

Colorado. G. M. List (September 21): The fall webworm defoliated large numbers of cottonwood trees in several sections of the State during August. The worst infestation occurred in the foothills in the vicinity of Colorado Springs and Fort Collins.

#### BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Indiana. J. J. Davis (September 23): Bagworms have been destructive as far north as Kokomo and Delphi, which are farther north than previous records.

Tennessee. G. M. Bentley (September 26): There is a very heavy outbreak of the bagworm in several counties in central Tennessee. The insect is especially numerous on arbovitae grown on estates and on wild cedars.

Nebraska. M. H. Swenk (September 15): Specimens were sent in from Nemaha County on August 22.

Texas. H. E. Parish (August 22): Bagworms are causing a great deal of damage to oriental cedar in the town of Menard.

BEECHBEECH SCALE (Cryptococcus fagi Baer.)

New England and New York. J. V. Schaffner, Jr. (September 27): Recent surveys of the sample plots in Waldo, Hancock, and Washington Counties, Maine, show a definite increase in infestation in beech. Scouting through southern Vermont and the Adirondack section of New York failed to disclose any infestations.

CATALPACATALPA SPHINX (Ceratonia catalpae Bdv.)

Virginia. H. G. Walker (September 26): The catalpa sphinx is moderately abundant in the Tidewater area.

Ohio. E. W. Mendenhall (September 4): The catalpa sphinx moth is very abundant at Rome. The catalpa trees are all defoliated in this vicinity.

CATALPA MEALYBUG (Pseudococcus comstocki Kuw.)

Connecticut. N. Turner (September 5): The catalpa mealybug is abundant and causing injury to several street trees (Catalpa speciosa) in New Haven. In 1930 trees in this locality were heavily infested. The present infestation is much lighter.

ELMA BARK BEETLE (Scolytus multistriatus Marsh.)

Pennsylvania. A. B. Champlain (September 6): I was called to investigate borer-infested trees in vicinity of Indian Echo Cave and found this beetle in a number of trees.

AN APHID (Tuberculatus ulmifolii Monell)

Connecticut. W. E. Britton (September 23): Extremely abundant on elm trees at Clinton early in September and honeydew dripped on parked automobiles. A few specimens received from Simsbury.

FIRHEMLOCK SPANWORM (Ellobia fiscellaria Guen.)

Maine. H. B. Peirson (September): Larvae abundant on fir along park trails, and from September 10 to 12 the flight of moths on Mount Desert Island was heaviest in recent years.

LOCUSTA LEAF MINER (Lithocolletis sp.)

Connecticut. G. H. Plumb (September): Sub-oval white, tent-like mines found on the underside of the leaves of black locust at South Norwalk on September 10. They contain from one to several larvae each, and pupae in oval, flattened silky cases suspended between the leaf surfaces. An adult emerged on September 16.

MAPLEGREEN-STRIPED MAPLE WORM (Anisota rubicunda Fab.)

Rhode Island. E. P. Felt (September 23): The green-striped maple caterpillar was reported in moderate numbers from the vicinity of Providence.

OAKORANGE-STRIPED OAK WORM (Anisota senatoria S. & A.)

Indiana. J. J. Davis (September 23): The yellow-striped oak caterpillar has been frequently reported as defoliating oaks, particularly pin oak, in Starke and Pulaski Counties. The defoliation is quite general throughout these counties. The first reports were received the last of August and reports have continued up to the present time.

PINEA SCARABAEID (Pachystethus olivia Horn)

Michigan. L. W. Orr (September): Severe defoliation of jack pine and other pines has occurred in the Manistee National Forest in Michigan. The defoliation is very similar to that caused by the spruce budworm (Harmoloba fumeriferana Clem.) in that it is confined to the needles of the current year's growth. The infestation, while extensive, is not at present general.

PALES WEEVIL (Hylobius pales Boh.)

Pennsylvania. E. P. Felt (September 23): Pales weevil work at the base of the trunk of Scotch pines was received from the Philadelphia area.

PINE BUTTERFLY (Neophasia menapia Feld.)

Washington. E. J. Newcomer (August 26): Adults observed in large numbers along Haches Pass highway 15 or 20 miles east of Enumclaw, King County.



SPRUCEWHITE SPRUCE SAWFLY (Noodiprion polytomum Htg.)

New England and New York. H. J. MacAloney (September 27): Has been found on spruce as far south as New Haven, Conn., northwest through the Adirondacks, and as far west as Norwich, N. Y.

TULIP TREETULIP TREE SCALE (Toumeyella liriiodendri Gmel.)

Connecticut. E. P. Felt (September 23): Young of the tulip tree scale have appeared in large numbers at Stamford with the probability of a considerable abundance of the insect next year.

W. E. Britton (September 23): Specimens have recently been received from Middletown, Southington, and Winsted.

## INSECTS AFFECTING GREENHOUSE

## AND ORNAMENTAL PLANTS

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. M. P. Zappe (September 23): Present this summer in Salisbury and Stratford, two widely separated points. Very abundant in Salisbury but not doing much damage. In July adults were swarming and getting into a house. Adults began to appear late in June and a few were still present on September 17.

DEODARDEODAR WEEVIL (Pissodes deodarae Hopk.)

Mississippi. J. Milton (September 23): Numbers of complaints were received during the late summer and early fall from property owners in Jackson regarding injury to Cedrus deodara plants.

DOGWOODSCURFY SCALE (Chionaspis furfura Fitch)

Maine. H. B. Peirson (September 12): Scales very heavy on dogwood at Augusta. The male scales were very abundant this year and on September 12 the adult winged males were emerging in large numbers and mating was taking place.

GLADIOLUSGLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Connecticut. B. H. Walden (September 23): Where corms were treated before planting there was but little injury from thrips until about the first of September. There have been a few reports of heavy infestations where corms were not treated or where improper treatment was made.

New York. P. J. Parrott (September 27): Gladiolus thrips generally scarce, but injury bad in certain scattered plantings.

Florida. J. R. Watson (September 23): Heavy rains the first part of the month reduced the thrips on gladiolus to very small numbers.

Indiana. J. J. Davis (September 23): Gladiolus thrips reported destructive in several widely separated localities of the State.

Colorado. G. M. List (September 21): The gladiolus thrips are now quite general over the State, but the reports do not indicate as severe injury as occurred last season. Many commercial plantings have had almost a normal cut of flowers.

Utah. G. F. Knowlton (September 4): Gladiolus have been damaged much less by thrips during the current season than during the preceding summer.

LILACOYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

New York. R. E. Horsey (September): In a planting of 600 small lilac shrubs at Rochester 10 percent were found infested September 16 to 21, and a number of them were badly incrustated. This plantation was almost entirely free of scale 2 years ago.

MAGNOLIAMAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsey (September): I was surprised to find a few large adult scales with live young enclosed as late as September 12 on magnolia at Rochester.

# INSECTS ATTACKING MAN AND DOMESTIC ANIMALS

## MAN

### MOSQUITOES (*Culicinae*)

North Carolina. C. H. Brannon (September 24): Malaria is unusually severe in eastern North Carolina this year.

Florida. J. R. Watson (September 23): Mosquitoes were unusually abundant and troublesome over the entire State.

Tennessee. G. M. Bentley (September 26): Malarial mosquitoes, Anopheles punctipennis Say and A. quadrimaculatus Say, are very prevalent in western Tennessee and in parts of the central portion of the State. The yellow-fever mosquito (Aedes aegypti L.) is very annoying in dwellings and offices generally over the State. The common rain-barrel mosquito, Culex pipiens L., is prevalent near suitable breeding places.

### HUMAN FLEA (Pulex irritans L.)

Nebraska. M. H. Spenk (September 15): Specimens of the human flea were received on August 22 from Dodge County.

### CHIGGER (Trombicula irritans Riley)

Oklahoma. O. G. Babcock (September 9): Chiggers have been reported as causing some trouble in southern and central Oklahoma but were not present in excessive numbers.

### BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

New Jersey. C. H. Hadley (September 25): Many calls have been received concerning the black widow spider and numerous specimens have been sent in from the vicinity of Moorestown for identification.

Maryland. F. C. Bishopp (September 25): Several specimens have been sent to the Bureau of Entomology and Plant Quarantine from the District of Columbia and Maryland.

Florida. J. H. Tenhet (September 9): Black widow spiders are very numerous in "pockets" of sub-irrigation systems around Sanford. As many as 6 have been taken in a single tile opening. One farmer brought in 13 at one time, another 7, and a third farmer brought in 6.

Texas. R. Malirn (August 22): Two reports of black widow spider received from Dallas County.

Colorado. G. M. List (September 21): Numerous reports from nearly all sections of the State have been received throughout the summer.



Nebraska. H. H. Swenk (September 15): A specimen of the black widow spider was received from Knox County on September 5.

Arizona. C. D. Lebert (September 16): We have had more calls this season regarding the black widow spider than in any previous year. There is an abundance of them, but so far there have been but two instances of people having been bitten--and these were not fatal.

### CATTLE

#### SCREW WORMS (Cochliomyia spp.)

General. W. E. Dove (September 25): In the Southeastern States there was a noticeable decrease in the percentage of infestations in Louisiana, Georgia, and Florida, while in South Carolina, Mississippi, Alabama, and southeastern Texas there was a slight increase during the week ended September 7.

Illinois. F. C. Bishop (September 28): Under date of September 24, an outbreak of screw worms (C. americana Cushing and Patton) in Pike County, was reported. A considerable number of animals have been infested and some death loss has been experienced. Inquiry among farmers indicates that the screw worms first appeared this year early in August. Indications are that the pest was introduced with cattle shipped from the Southwest.

Kansas. O. G. Babcock (September 25): Ranchmen in the vicinity of Wellington, Medicine Lodge, Pratt, Saint John, Sublette, and Liberal reported infestations of their animals.

Oklahoma. C. F. Stiles (September 21): A recent survey shows that the screw worm is fairly generally distributed over the entire State, with the possible exception of the Panhandle. The cattlemen in the southern part of the State report them worse than in 22 years.

F. A. Fenton (September 23): Infestation was found to be serious in Love, Carter, Stephens, and Jefferson Counties, and diminished in intensity to the northwest and northeast. Reports have been received that the outbreak began in June and reached its peak in July and the early part of August. Owing to the above-normal temperatures the latter part of September, the intensity of infestation around Stillwater is increasing.

Texas. O. G. Babcock (September 25): In the Texas Panhandle screw worm cases were reported as being more numerous than for the past 4 years. Many cases were reported as being caused by the bites of flies.

H. E. Parish (August 22): One rancher reports having 300 cases of myiasis in 700 head of sheep. On August 20 a report was received from Mason that at least 75 percent of the young deer that have been dropped this season have been killed by screw worms. Grown deer also were observed with severe cases of worms.

### HORN FLY (Haematobia irritans L.)

General. O. G. Babcock (August 29 to September 9): An inspection of cattle from Abilene to Wichita Falls, Tex., showed from 25 to 50 flies present on each animal examined. The pest was very scarce between Wichita Falls and Oklahoma City, Okla., in western Oklahoma, southwestern Kansas, and the Texas Panhandle. However, it was quite abundant in the vicinity of Marietta, Ardmore, and Healdton, Okla.

South Dakota. H. C. Severin (September 18): Horn fly very abundant, as usual for this time of year.

### EAR TICK (Ornithodoros megnini Duges)

Mississippi. G. C. Broome (September 19): About a dozen nymphs of the spinose ear tick were taken from the ears of a young calf near Seminary in Covington County. This is the first report of the occurrence of this tick in Mississippi.

### TERMITES (Reticulitermes spp.)

Rhode Island. A. E. Stene (September 26): Our season started early with an unusual number of complaints of damage by termites.

Illinois. W. P. Flint (September 20): Many reports of termite damage continue to be received. In one instance termites were found killing corn along one side of a field for a distance of 25 rods. The first two rows in the field had been almost completely destroyed.

Nebraska. M. H. Swenk (September 15): A report received on August 20 from southern Gage County stated that several houses there were infested with R. tibialis Bks.

Oklahoma. F. A. Fenton (September 23): The usual number of letters were received requesting information on termite control.

Texas. H. E. Parish (August 22): Termites are causing considerable damage to the walls and floors of storm houses and cellars.

### EUROPEAN EARWIG (Forficula auricularia L.)

Colorado. G. M. List (September 21): The European earwig was found just east of Denver in July. It occurred in large numbers, indicating that conditions are not unfavorable. This is the first report of this insect in Colorado.

### A SOLDIER FLY (Hermetia illucens L.)

North Carolina. C. H. Brannon (September 27): Heavily infesting silage in Rowan County. This is first record we have of such an infestation.

RICE WEEVIL (Sitophilus oryzae L.)

Mississippi. C. Lyle and assistants (September 27): Serious injury to new corn in the field was reported by inspector L. J. Goodgame at Aberdeen, while old corn in cribs was badly damaged in various sections of the State. Many requests for information about the control of corn weevils have been received during the past few days.

## INSECT CONDITIONS IN HAITI FOR MAY, JUNE, AND JULY 1935

By

Andre Audant

Citrus trees at Damien were heavily infested with the green scale (Coccus viridis Green) on May 25. Reports were received from the South that the scale was damaging trees in the neighborhood of Miragoane.

The green chafar, Artipus psittacinus Gyll., was noticed on many citrus trees on the experimental farm on July 5 and was not destroyed by the usual application of lead arsenate.

Red scales, Carysomphalus gonidum L., are quite abundant this spring in Port-au-Prince, where a few plants have been killed.

Coconut trees in the Cul-de-Sac plain were attacked by Homaledra sabalella Chamb. on May 12. The fronds were falling down in the more heavily infested trees.

Rhinoceros beetles, Strategus quadrioveatus Bdv., were reported destroying many young coconut trees in the vicinity of Cape Haitien, May 15.

Coconut fronds infested with Aspidiotus destructor Sign. in Port-au-Prince, June 18.

Coffee leaves infested with Leucoptera coffeella Stainto, July 5, gradually diminished with the advent of spring showers.

The boll weevil (Anthonomus grandis Boh.) was observed as far as Hatte Lathan on the cotton experimental farm, July 3. The adults were carried by the wind blowing from Petionville. As there have been no bolls on the cotton plants since April, it is believed that the beetles have been aestivating under trash and came out after the showers of the last few days of June. They were quite abundant on the tender shoots, as many as 15 adults being found on a single 1-year cotton tree. Nevertheless no weevils were found on the road between Port-au-Prince and Hatte Lathan.

A few cotton aphids (Aphis gossypii Glov.) were noticed on young cotton shoots near Port-au-Prince May 5, in relation with the crazy ant Paratrechina longicornis Latr.

Flea beetles, Epitrix parvula Fab., were puncturing the tobacco leaves on the experimental plots at Damien, May 30.



Saissetia hemisphaerica Targ. was noticed on many Hibiscus sp. in flower beds around Port-au-Prince, May 12.

The leaf cutting bee, Megachile concinna Smith, was reported from several localities damaging severely rose beds around towns the middle of June, with no definite control to check them.

The fire ant, Solenopsis geminata Fab., was quite abundant in houses at Pétionville and Port-au-Prince, June 3. In several cases they were associated with the "TiCacos" (Little Cacos) ants Pheidole megacephala Fab. ? which seem to drive them away.

An invasion of mosquitoes, Culex quinquefasciatus Say, Aedes aegypti L., and Psorophora sp., occurred in May throughout the Cul-de-Sac plain, biting horses and mules, as well as human beings.

#### INSECT NOTES FROM PUERTO RICO

G. M. Wolcott reported on September 15 that in the last few months two rather extensive collections of injured rice have been sent in, from Arecibo and from Fajardo, injured by Diatraea saccharalis Fab. If low-land rice is ever grown extensively this may become a rather serious pest in Puerto Rico.

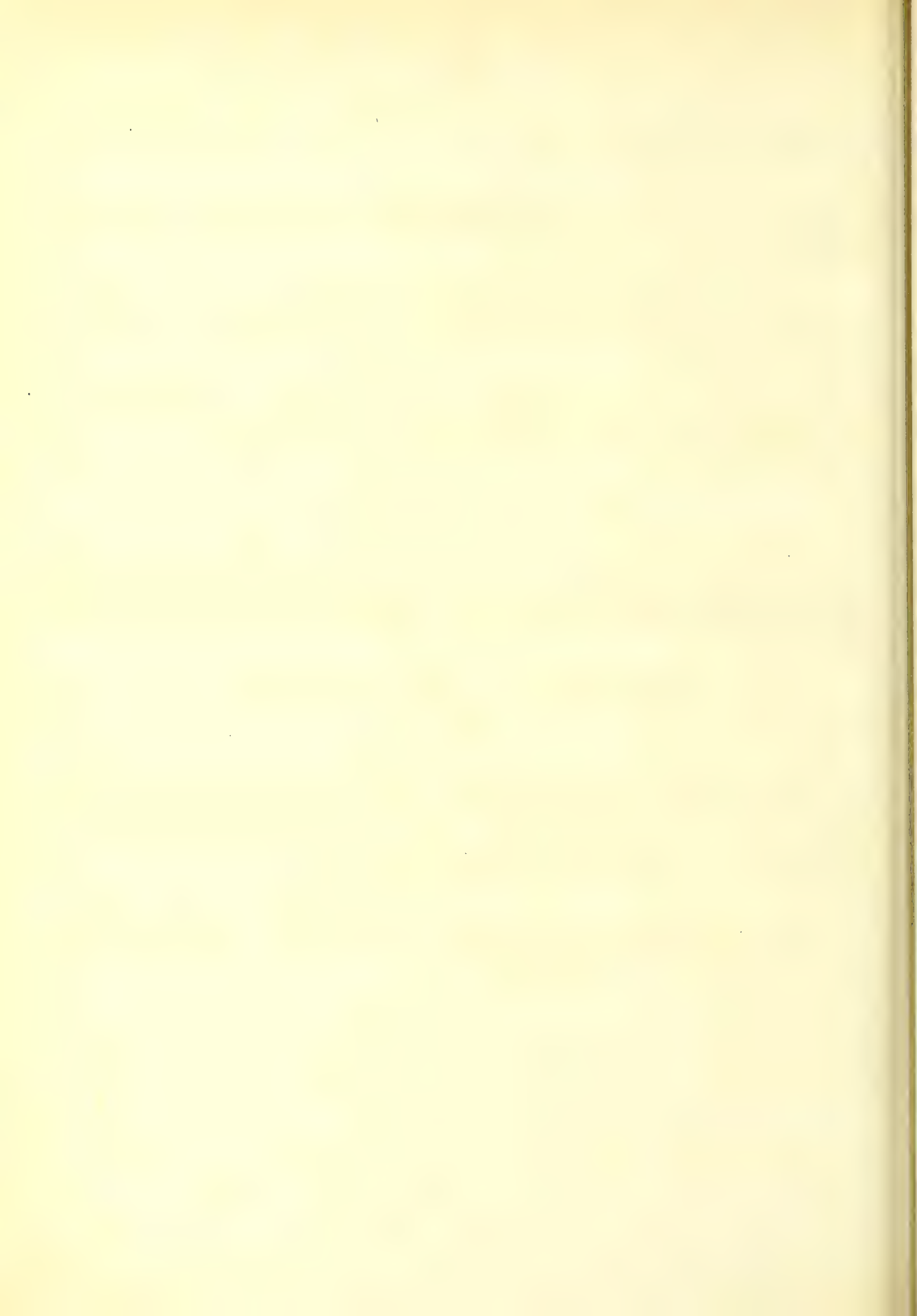
#### INSECT CONDITIONS IN EGYPT FOR AUGUST 1935

By

A. H. Rosenfeld

Thanks to thorough measures of the Government authorities, the damage caused by the leaf worm (Prodenia) in the Delta has been only from 2 to 10 percent from south to north. Rather serious isolated attacks have occurred in Upper Egypt as far south as Asyut, where, due to their rarity, the fellaheen are not experienced in fighting it.

Some attacks of the two boll worms have been reported in the North of the Delta, varying from 2 to 5 percent, but there were no reports of damage by these insects from Upper Egypt.



# INSECT PEST SURVEY BULLETIN

Vol. 15

November 1, 1935

No. 9

## THE MORE IMPORTANT RECORDS FOR OCTOBER 1935

The month of October was unusually favorable to grasshopper development. Damage to late crops is reported from Iowa to Arizona. Extensive flights are recorded from Kansas.

The Mormon cricket was reported as abundant in parts of North Dakota and Idaho. In Idaho a nematode is infesting these insects in considerable numbers.

During the second and third weeks in October there was heavy oviposition by the hessian fly in central Indiana.

The chinch bug was reported as going into hibernation in sufficient numbers to indicate possible damage next year from Indiana to Kansas and Oklahoma.

Although the codling moth was reported as generally less abundant in the Eastern States, it was apparently more destructive than usual in the Sacramento Valley of California this year.

The apple maggot was quite prevalent in Monmouth County, N. J., with very heavy infestations in neglected orchards.

The rosy apple aphid developed its oviparous generation about 2 weeks earlier than usual in Virginia and is so abundant that an outbreak is expected in that State next year.

Heavy infestations of truck crops by the southern green stink bug were reported from Florida and Alabama.

Very heavy infestations of tomatoes by the corn ear worm were reported from the Gulf region to Kansas and westward to California. In some fields in central California as high as 25 percent of the tomatoes were infested. The tomato pinworm was also very abundant on tomatoes in parts of California.

A leaf folder, Pachyzancla periusalis Walk., was reported as seriously damaging plant-bed tomato plants on the Gulf coast of Mississippi.



Reports from the Mississippi Valley cotton district indicate that the boll weevil was less abundant than usual.

Flights of moths of the cotton leaf worm were reported during the latter half of October in Iowa and Illinois and during the first week of the month in Michigan.

The fall webworm was less abundant than usual in New England and considerably more abundant in the Central States and in the Southwest.

A cottonwood leaf miner, Proleucontera albella Chamb., was defoliating cottonwood trees in Kern County, Calif. This is apparently the first record for this insect in that State.

Black widow spiders attracted considerable attention throughout the country during October, reports being received from Illinois to California.

The screw worm has been found at a number of places in Illinois, Kentucky, Iowa, Missouri, and Kansas.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Iowa. H. E. Jaques (October 21): The current summer and fall have been unusually favorable for grasshoppers, and eight or ten species not heretofore recorded for the State have been collected.
- Missouri. L. Haseman (October 28): There has been an unusual abundance of the red-legged grasshopper (Melanoplus femur-rubrum DeG.) over much of the State this fall and in spite of earlier frosts it continues to be rather abundant at this time.
- Arkansas. Transradio Press (October 30): "A flight of grasshoppers has taken possession of the town of Helena. Soon after dark last night hordes of insects dropped out of the sky. They covered the streets, buildings, trees, and automobiles. Most of them are more than 2 inches long."
- Kansas. H. R. Bryson (September 25): M. mexicanus Sauss. is the most numerous species in most sections of the State. Some injury has been caused in a number of localities, making it necessary to apply control measures. This has been especially true where fall alfalfa and winter wheat have been sown. This species has been very active in flight and some flights have approximated a migration. Reports of such flights have been received from Beloit, Mitchell County, and Minneapolis, Ottawa County. The blue-stem district has a heavy population. M. differentialis Thos. and M. femur-rubrum also occur in considerable numbers in some localities.
- Oklahoma. C. F. Stiles (October 23): Grasshoppers have been unusually destructive in Payne and adjoining counties. Much late feed and many fall gardens have been destroyed.
- Arizona. W. A. Stevenson (October 5): A heavy infestation of grasshoppers developed during the past 10 days in the vicinity of Fresnal on the Papago Indian Reservation. One small planting of chili pepper has been completely destroyed. Considerable feeding was also noted on many of the range grasses and weeds, especially pigweed.
- V. L. Wildermuth and E. G. Davis (September): In the Salt River Valley M. mexicanus gave a second hatch of grasshoppers the middle of July. Many fields showed a high population count. The outbreak was controlled readily, however, by the use of poisoned-bran mash. One field southeast of Tempe was not poisoned, and in this field continuous observations have been made for the past 3 months. We were especially anxious to ascertain the time, place, and egg-laying habits of the mature females. On September 25 many hoppers were noted ovipositing. They were placing their eggs mostly on the raised borders in the field, rather than in the level areas between. In addition to the hoppers noted ovipositing, many showed distended abdomens. It is interesting to note that all stages of hoppers were present in the field, from newly hatched first-instar nymphs to mature adults.

About 80 percent of the hoppers were mature. It is hoped from these observations that we will have less trouble in locating eggs during our fall survey this year than was the case in the past survey.

Idaho. C. Wakeland (October 23): The grasshopper egg survey is about two-thirds completed. Eggs are very scarce in all communities surveyed to date and entirely absent in many.

#### MORMON CRICKET (Anabrus simplex Hald.)

North Dakota. J. A. Munro (October 23): Found in northeastern part of Montrail County at the rate of one per 3 square yards in range land.

Idaho. C. Wakeland (October 23): We recently made a trip to the area where Gordius villoti Rosa was found infesting A. simplex last July. Male and female neratodes were found in masses under overhanging banks along small streams and a few were observed in the water. Mormon cricket eggs are abundant over much of the area where outbreaks occurred this year and it is probable that the infestation in 1936 will be even greater than in 1935. More of them have oviposited on agricultural land than heretofore.

#### PLANT BUGS (Pentatoridae)

California. S. Lockwood (October 2): Cotton, barley, peaches, and figs in the San Joaquin Valley have been damaged by one or all of the following plant bugs: Say's plant bug (Chlorochroa sayi Stahl); the red-shouldered plant bug (Thyanta brevis Van D.); and the green soldier bug (Acrosternum hilaris Say). The worst damage to peaches has been caused by the green soldier bug. The other three species mentioned were responsible for most of the damage to cotton and barley.

#### FALL ARMYWORM (Laphygma frugiperda S. & A.)

California. H. H. Keifer (October 24): The collection of a single adult in a light trap near Chula Vista, San Diego County, on September 26 indicates the presence of this insect in the State for the third year. During the other 2 years, 1931 and 1934, its presence was noted by the injury it caused to corn. So far as we know there was no commercial damage to corn in California in 1935. The species is now presumably established in the agricultural district contiguous to the Gulf of lower California, where it can overwinter and invade California during the warm weather. This condition, according to available records, is a comparatively recent development.

#### LESSER CORN STALK BORER (Elasmopalpus lignosellus Zell.)

Alabama. J. M. Robinson (October 23): The lesser corn stalk borer was reported from Camp Hill, Tallapoosa County, where it was destroying kudzu seedlings.

#### WHITE GRUBS (Phyllophaga spp.)

Vermont. H. L. Bailey (October 23): Reports continue to arrive of serious injury to potato tubers by white grubs. Rutland, Chittenden, Franklin,



and Orange Counties appear to have most serious infestations.

Massachusetts. L. H. Worthley (October 9): Severe damage to strawberry roots and sod was observed by a district inspector at a nursery in Westwood. Damage to the lawn was first noted early in August. Counts showed about 12 grubs per square foot in the affected plots.

MONARCH BUTTERFLY (Danaus plexippus Hbn.)

Kentucky. W. A. Price (October 24): Large numbers were observed in migration southward in Lexington on October 20.

SWALLOWTAILS (Papilio spp.)

Florida. J. R. Watson (October 23): Orange dogs (P. cresphontes Cram.) have been more than usually troublesome to nursery stock.

Iowa. H. E. Jacques (October 21): Many caterpillars of the tiger swallowtail (P. glaucus turnus L.) have been sent in from different regions where they have aroused interest.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

Indiana. W. B. Noble (October 19): Abundant oviposition by the hessian fly occurred in central Indiana on September 12 to 15 and on October 12 to 18. Flies emerging from volunteer wheat were largely responsible for the eggs laid during the latter period. Little, if any, winter wheat was sown in time to become infested by the flies emerging in September, but volunteer wheat received a heavy infestation. Some infestation of the sown wheat will probably develop as a result of the October emergence.

Illinois. W. P. Flint (October 22): Our experimental plots of sown wheat indicate only light infestation.

APPLE GRAIN APHID (Rhopalosiphum prunifoliae Fitch)

Nebraska. M. H. Srenk (October 1 to 30): On October 4 reports were received that winter wheat in Washington County was badly infested with the apple grain aphid.

FALSE WIREWORM (Eleodes opaca Say)

Kansas. H. R. Bryson (October 5): False wireworms were causing injury to fall-sown wheat in the vicinity of Junction City, Geary County. R. H. Painter also found that larvae were numerous in a field of volunteer wheat near Junction City. These reports are significant because Abilene,

Dickinson County, is usually considered the eastern limit of commercial damage by this species. A report of injury to wheat in Hodgeman County was also received.

### CORN

#### CHINCH BUG (Blissus leucopterus Say)

- Indiana. C. Benton and A. C. Cole, Jr. (October 14): Chinch bugs have been breeding throughout the season in foxtail grass as well as in corn in the vicinity of La Fayette. The adults are gradually going into hibernation in large numbers in this locality.
- Illinois. W. P. Flint (October 22): A survey of chinch bug conditions in standing corn and to some extent in hibernating quarters has been carried on over about three-fourths of the infested area of Illinois. The results of this survey indicate danger of moderate damage in 1936 in most of the area infested in 1935. Apparently there will be less damage in the northeastern part of the area and a somewhat more serious damage along the southern edge and especially in the southwestern and western parts of the area infested in 1935.
- Iowa. H. E. Jaques (October 21): The chinch bug has gone into hibernation in large numbers at many places in southeastern Iowa.
- Kansas. H. R. Bryson (October 5): The chief injury caused this fall may be found in the cane and kafir fields. Bugs may be found at Manhattan but are not numerous. E. G. Kelly reports that the bugs are abundant and causing some injury to the cane, kafir, and Sudan grass in the following counties: Ottawa, Shawnee, Coffey, Bourbon, Woodson, Wilson, Corley, and Harper.
- Mississippi. D. W. Grimes (October 23): A light infestation of chinch bugs on late corn at Belzoni.
- Oklahoma. C. F. Stiles (October 23): Chinch bugs are present in fairly large numbers on grain sorghum in Payne and Pawnee Counties.

#### SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

- Indiana. P. Luginbill (October 19): Adults are common on alfalfa, particularly in fields adjacent to corn. Most of them appear to have recently emerged. The larvae have been reported as quite injurious to corn in several localities this year.

### SORGHUM

#### LEAF-FOOTED BUG (Lentoglossus phyllopus L.)

- Texas. H. J. Reinhard (October 18): Leaf-footed plant bug very abundant on immature grain sorghum seed in Madison County.

PACIFIC RED SPIDER (Tetranychus pacificus Mc G.)

California. S. Lockwood (October 2): This red spider was observed doing considerable damage to one of the grain sorghums in Kern County in September.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (October 17): Larval populations throughout the infested area in middle lowland California remain small. Highest counts are found in the San Francisco Bay area, where at the present time as many as 75 have been taken to 100 sweeps of an insect net. On September 30 in one field in this area 38 out of 118 large larvae were found to be parasitized by Bathyplectes curculionis Thoms.

F R U I T I N S E C T S

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Georgia. C. H. Alden (October 21): The entire crop has been cleaner than in several years past and codling moth injury is considerably reduced.

Ohio. T. H. Parks (October 23): Counts made in 57 Ohio orchards where the spray service was followed shows the codling moth to be well controlled by two (in a few orchards three) cover sprays against the first brood and by one cover spray against the second brood. The average number of stung or wormy fruits in the 57 orchards is 3.2 percent. This is the lowest injury since 1929.

Missouri. L. Haseman (October 23): Checkups in experimental and other orchards during October indicate that fewer larvae are going into hibernation this year than in the past several years.

California. S. Lockwood (October 2): During the summer the codling moth proved to be more serious than usual and certainly has been more injurious than in 1934 to apples and pears over much of the Sacramento Valley. In some areas larvae were found in peaches. This was particularly true in Sutter County, where the damage done ranged around 1 percent in some peach orchards.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

Missouri. L. Haseman (October 23): During the past 3 weeks there has been a scourge of late yellow-necked apple worms on both bearing and young apple trees in central Missouri. I have never known this pest to have a September and October brood before.



APPLE MAGGOT (Rhagoletis pomonella Walsh)

New Jersey. M. Kisliuk, Jr. (October 2): The apple maggot is apparently quite generally distributed in Monmouth County. Apples from neglected yard plantings and orchards are generally infested, the infestation sometimes approaching 100 percent. Commercial and home orchards that are sprayed regularly show much less infestation. It has been noted that sometimes there are more flies noticeable in September than in July, a possible indication that there are two generations a year, or that there is a very long period of emergence.

ROSY APPLE APHID (Anuraphis roseus Baker)

Virginia. W. S. Hough (October 28): Fall migrants and oviparous females are abundant in all orchards. The oviparous generation is developing about 2 weeks earlier than usual. The unusual abundance of the oviparous form leads us to expect a general outbreak in the spring of 1936.

BOXELDER BUG (Lentocoris trivittatus Say)

Utah. G. F. Knowlton (September 26): Boxelder bugs are clustering in great numbers on prunes and apples at High Creek in Cache County. The prunes become shriveled and the outer quarter inch of apples becomes corky, owing to these heavy attacks. In one instance more than one hundred bugs were massed around the outside of a prune.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (October 19): The infestation at Fort Valley increased rapidly last month and a number of peach orchards in this locality are now heavily infested. The general infestation is heavier than that of an average year. The very dry weather during September and October has favored reproduction.

C. H. Alden (October 21): The San Jose scale has been increasing since September and many incrustated areas have been found on both peach and apple trees. The scale is also getting on the apple fruit and in many instances apples that would otherwise grade as fancy have been reduced to culls.

Tennessee. G. M. Bentley (October 9, 12): The San Jose scale is unusually prevalent in the apple orchards of commercial and home plantings and on scattered peach trees in the western part of the State.

PEACH

PEACH BORER (Aegeria exitiosa Say)

Alabama. J. M. Robinson (October 23): The peach tree borer is moderately abundant. Control measures are being applied.

Georgia. O. I. Snapp (September 25): Adult emergence was practically completed in the field at Fort Valley by September 25, which is earlier than usual. The general infestation in 1935 was moderate or a little lighter than usual. We attribute this to predators and to the better application of control measures by more growers than formerly.

C. H. Alden (October 21): Annual treatment at Cornelia has kept the larval injury on about the same basis as for several years past. A few untreated orchards are heavily infested.

LESSER PEACH BORER (Aegeria pictipes G. & R.)

Mississippi. Jack Milton (October 23): Injury by the lesser peach tree borer to peaches in Scott County was noticed on October 15.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Georgia. C. H. Alden (October 21): Moths continued coring to the bait traps at Cornelia up to October 1, mostly from an adjacent peach orchard. Larval work in apples was very light.

Mississippi. C. Lyle (October 23): General injury to twigs has been reported from various sections of the State during the month.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia. O. I. Snapp (September 26): Considerable jarring of peach trees on this date showed that at Fort Valley the plum curculio had left for hibernation places.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Georgia. O. I. Snapp (October 19): Infestation has increased in central Georgia during recent months, and is now heavier than that of an average year. The increased infestation by the San Jose scale (Aspidiotus perniciosus Comst.) has contributed to the increase in shot-hole borers as secondary pests attacking the more or less devitalized trees.

GRAPE

GRAPE LEAFHOPPER (Erythroneura cores Say)

Nebraska. M. H. Srenk (September 15): A Merrick County correspondent reported his grapevines as being infested on August 27 and a Dawson County correspondent made a similar complaint regarding his woodbine vines on September 14.

Utah. G. F. Knowlton (September 19): Grape leafhoppers are seriously damaging grape foliage at Hurricane and Virgin and Virginia creeper foliage at Richfield, Leeds, La Verkin, and Saint George.

California. B. L. Fox (September 5): The grape leafhopper is doing a moderate amount of injury to grapevines locally in Kern County, but the injury is not sufficient to warrant control measures this late in the season.

PECAN

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Mississippi. C. Lyle (October 23): The pecan shuck worm is reported by inspector H. Gladney, of Ocean Springs, as causing some damage, but on account of the heavy crop of pecans the injury seems lighter than last year. Another report was received from Richton and injury was also noticed at State College.

TWIG GIRDLER (Oncideres cingulatus Say)

Mississippi. C. Lyle (October 23): Serious injury to pecan trees was observed by inspector G. L. Bond near Avera on October 10. Inspector Jack Milton at Jackson has observed several cases of damage, which does not seem to be as serious as last year.

FIG

DARKLING BEETLES (Tenebrionidae)

California. H. C. Donohoe (September 30): Adults of Blattinus rufipes Csy., and Eulabis rufipes Esch. did considerable damage to Calimyrna figs in the Fresno area during the early part of the harvest. The first picking (late August and early September) was heavily infested, the damage consisting of general surface feeding and, especially, of internal feeding in the large, extra-quality fruits with open eyes, which afforded entrance to the central cavities.



## TRUCK - CROP INSECTS

### VEGETABLE WEEVIL (Listroderes obliquus Gyll.)

Alabama. J. M. Robinson (October 23): The vegetable weevil has appeared in turnips and lettuce in fall gardens.

Mississippi. M. M. High (October 21): The vegetable weevil for the past 30 days has been unusually scarce and hard to find in Gulfport, owing to the extremely dry weather. Weevils were in aestivation quarters until about October 15, when small collections were made about turnips, but only slight feeding was in evidence.

### BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Georgia. T. L. Bissell (October 9): Scattered adults have been found since September 1 in various places, including dahlia blossoms. I do not recall having seen this species at Experiment before this year.

Alabama. J. M. Robinson (October 23): The banded bean beetle is moderately abundant in gardens.

Mississippi. M. M. High (October 21): The belted cucumber beetle is fairly abundant on young turnips and cabbage at Biloxi and Long Beach on the coast.

### FALSE CHINCH BUG (Nysius ericae Schill.)

Mississippi. M. L. Grimes (October 23): The false chinch bug was observed on turnips at Meridian.

Texas. H. J. Reinhard (October 22): Sent in with complaint of severe damage to turnips at Valley Junction on October 14.

### TARNISHED PLANT BUG (Lycus pratensis L.)

Missouri. L. Haseman (October 28): The summer and fall have been ideal for growth of Erigeron canadensis and the weed has been fairly teeming with tarnished plant bugs in all stages of development during October. This pest is sure to cause trouble in 1936.

### SOUTHERN GREEN STINK BUG (Nezara viridula L.)

Florida. F. S. Chamberlin (October 23): Numerous complaints received this month regarding severe damage to beans and other truck crops.

Alabama. J. M. Robinson (October 23): W. D. Thoroson, county agent at Ozark, reported that the green stink bug developed in large numbers in the tract of land devoted to truck crops. As the crops were destroyed by drought in August, the stink bugs spread to the adjacent fields of cotton. They so

severely attacked the bolls that only one-half bale was picked from 12 acres. Other adjacent fields were as severely attacked.

SWEETPOTATO HORNWORM (Herse cingulata Fab.)

Alabama. J. M. Robinson (October 23): J. D. Sanford, of Montgomery, reported 40 acres of sweetpotato foliage destroyed. The larvae, in migrating from the field, accumulated in a ditch barrier to the extent of a wagon load.

CHANGA (Scatteriscus vicinus Scudd.)

Florida. J. R. Watson (October 23): Mole crickets, chiefly the changa, are troublesome in gardens and seed beds in many sections, including the celery seed beds around Sanford and gardens over the southern part of the State.

TOMATO

CORN EAR WORM (Heliothis obsoleta Fab.)

Mississippi. C. Lyle (October 23): Late tomatoes are being seriously damaged in several localities, reports being received from Meridian, Dossville, and State College. It was also reported as injuring late corn at Belzoni and Senatobia.

Kansas. H. R. Bryson (September 18): The corn ear worms were very plentiful in alfalfa all fall. They were also present in truck patches, causing some injury to beans and tomatoes. Probably the most serious injury has been in alfalfa fields and in sorghum heads, where the damage cannot be readily measured.

Texas. H. J. Reinhard (October 22): Up to the middle of October this insect had caused considerable damage to late grain-sorghum crops in Burleson, Brazos, and Madison Counties.

California. A. E. Michelbacher (October 17): In some fields in central California as high as 25 percent of the tomatoes are infested with the corn ear worms. A survey just completed showed that in general from about 5 to 25 percent of the fruit was infested.

J. C. Elmore (September 30): Several tomato fields at El Cajon, San Diego County, showed that 25 percent of the fruit was infested.

TOMATO PINWORM (Gnorimoschra lycopersicella Busck)

California. S. Lockwood (October 2): On September 10 of this year the tomato pinworm was found in the hills northeast of Felton, Santa Cruz County. The infested plant was a native Solanum, either S. xanti or S. umbelliferum.

J. C. Elmore (October 18): The tomato pinworm has built up to injurious numbers at San Juan Capistrano, where 69 percent of the fruit was infested on September 25. Near Santa Ana, Orange County, on the same date, 70 percent of the ripe fruit was infested. In summer growing areas pinworms are either absent or the infestation is not more than 2 or 3 percent.

A LEAF FOLDER (Pachyzancla periusalis Walk.)

Mississippi. M. M. High (October 21): The tobacco leaf folder was found at Long Beach in a tomato seed bed on August 27, where it caused serious damage by folding and devouring the leaves. This is the second record of the pest injuring tomatoes in Mississippi.

A BUMBLE FLOWER BEETLE (Euophoria senulchralis Fab.)

Mississippi. C. Lyle (October 23): A correspondent at Oldenburg reports that this insect is damaging tomatoes. This is the first time such damage has been recorded here.

BEANS

MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

South Carolina. F. Sherman (October 23): Apparently normal adults emerging from pupae exposed to killing frost on October 14.

Georgia. C. H. Alden (October 21): Fall crop of beans at Cornelia seriously injured.

T. L. Bissell (October 8): A large number of adults of the Mexican bean beetle are feeding on a few lima bean plots at Experiment.

LEAFHOPPERS (Cicadellidae)

Florida. J. R. Watson (October 23): Bean jassids worse than during an average year and are damaging beans over Alachua, Marion, Orange, and other counties.

Mississippi. M. M. High (October 21): The bean leafhopper (Emoasca mali ? LeB.) has caused serious damage to all varieties of beans and cowpeas in southern Mississippi.

GREEN STINK BUG (Acrosternum hilaris Say)

North Carolina. L. W. Leiby (September 20): Completely destroyed a crop of lima beans at Brevard.

BEAN LEAF ROLLER (Goniurus proteus L.)

Florida. J. R. Watson (October 23): The bean leaf roller is common, doing considerable damage to beans.



BEAN THRIPS (Heliothrips fasciatus Perg.)

California. S. Lockwood (October 2): For the past 4 weeks the bean thrips has been responsible for considerable silvering of bean leaves over much of the Sacramento Valley. This pest has also been present, but far less injurious, on winter peas in the same area.

CABBAGE

HARLEQUIN CABBAGE BUG (Murgantia histrionica Hahn)

Maryland. E. N. Cory (October 10): The harlequin cabbage bug is attacking kale and mustard plants at Ellicott City.

Tennessee. G. M. Bentley (October): The harlequin bug has been unusually numerous on cabbage, cauliflower, rape, and turnips in different parts of the State.

Alabama. J. M. Robinson (October 23): The harlequin cabbage bug was very active on snap beans and lima beans at Auburn and in Montgomery during the first 2 weeks of September. Attacking turnips at Luverne on September 25.

Mississippi. M. M. High (October 21): Observed injuring collards at Cedar Lake.

CABBAGE LOOPER (Autographa brassicae Riley)

Mississippi. N. D. Peets (October 23): The cabbage looper is causing serious injury to rutabagas in Lincoln and Coniah Counties.

Texas. H. J. Reinhard (October 22): S. W. Clark, Weslaco, reports that this insect was extremely abundant in early cabbage seedbeds on October 20 and also attacking lettuce and Chinese cabbage.

CABBAGE WEBWORM (Hellula undalis Fab.)

Mississippi. D. W. Grimes (October 23): Serious injury to turnips at Kosciusko.

M. M. High (October 21): The imported cabbage webworm is more abundant on cruciferous crops in southern Mississippi than for several seasons.

IMPORTED CABBAGE WORM (Ascia rabeae L.)

California. R. E. Campbell (October 18): The imported cabbage worm is still prevalent in most of the cabbage and cauliflower fields of southern California. Considerable dusting has been necessary to keep it under control. Although there are actually more cabbage loopers (Autographa brassicae Riley) than cabbage worms, the latter are the principal cause of injury.

ONION THRIPS (Thrips tabaci Lind.)

Nebraska. M. H. Srenk (October 8): A Nemaha County correspondent reported that the onion thrips was destroying his late cabbage crop.

SQUASH

SQUASH BUG (Anasa tristis DeG.)

Kansas. H. R. Bryson (October 5): Squash bugs are quite abundant in pumpkin and squash plantings. Owing to the dry weather during the summer, squashes and pumpkins are comparatively fewer than in past years, but those that survived have a high population of bugs. Many of the bugs are still immature.

Utah. G. F. Knowlton (October 15): Squash bugs have caused serious damage to squash in infested areas of the State. A few agricultural sections have not as yet become infested.

MELON WORM (Diaphania hyalinata L.)

South Carolina. W. C. Nettles (October 23): The melon worm is unusually destructive to stems of late squash near Beaufort.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicæ Davis)

Mississippi. C. Lyle (October 23): Injury to turnips is reported as light at Ocean Springs and severe at Grenada, Jackson, Meridian, and Kosciusko.

CARROT

A GEOMETRID (Orthonara obstipata Fab.)

Mississippi. M. M. High (October 21): A single specimen was reared from carrot at Biloxi. (Det. by F. H. Benjamin.)

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius Fab.)

Mississippi. G. L. Bond (October 23): Sweetpotato weevils are rather abundant along the coast of Jackson County east of the Pascagoula River.

STRAWBERRY

STRAWBERRY LEAF ROLLER (Ancylic comotana Froel.)

Ohio. E. W. Mendenhall (October 18): The strawberry leaf roller is very injurious to strawberry plants in Clark, Miami, and Montgomery Counties this fall. There seems to be a late brood which is very abundant.

SPINACH

GREEN PEACH APHID (Myzus persicae Sulz.)

Maryland. E. N. Cory (October 22): Infestation general throughout Patapsco Neck.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy (Sept. 28): Most cotton around Florence has a luxuriant second growth and there appear to be more boll weevils than during any fall since 1929. (October 12): There are large numbers of boll weevils in the fields--more than any year since 1929.

Alabama. J. M. Robinson (October 23): The boll weevil is moderately abundant.

Mississippi. C. Lyle (October 23): Because of the general defoliation of cotton by Alabama argillacea Hbn. over most of the State, together with the early maturity of plants and shedding of leaves, boll weevils are not generally abundant in cotton fields. Rains just beginning may promote growth of the plants in sections where they have not been killed by frost, but indications are that the number of weevils entering hibernation will be lower than normal.

Louisiana. R. C. Gaines (October 19): Collections of boll weevils on flight screens in Madison Parish on similar dates for several years indicate fewer boll weevils in the fields this fall than during the past 3 years.

Oklahoma. F. A. Fenton (October 19): Reports indicate fewer boll weevils present in the fields than at this time last year, despite the fact that the rainfall this year was greater than last.

Texas. R. W. Moreland and A. B. Beavers (September 21): In Brazos and Burleson Counties weevil infestations are building up in fields where squares are plentiful. (October 19): Weevils are abundant in fields where squares and young bolls are plentiful. Collected 10,000 weevils on October 14 for hibernation cages without any trouble.

K. P. Ewing and R. L. McGarr (September 21): In Calhoun County damage continues in most fields where unopened bolls are present.

THURBERIA WEEVIL (Anthonomus grandis thurberiae Pierce)

Arizona. W. A. Stevenson and J. M. Breazeale reported on October 15 a 0.6-per-cent infestation of cotton bolls by the thurberia weevil in a 52-acre field of cotton at Midvale, in the Santa Cruz Valley, about 5 miles south of Tucson. This is the first record of the thurberia weevil in commercial plantings of cotton in the Tucson district this season.



PINK BOLL WORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman and associates (October 17): In 11 fields of the Big Bend of Texas examined on October 11 to 17 the boll infestation was 96.2 percent. All of these fields but 2 were infested 100 percent, the other 2 having 76 and 80-percent infestations.

Puerto Rico. L. C. Fife (October 2): The low infestation in Sea Island cotton on the northern coast is probably due to: (1) No cotton has been grown commercially in Puerto Rico during the past three years; (2) wild cotton trees were almost eradicated from the island in 1934 and 1935; (3) no other favorable host plants occur in sufficient numbers to maintain a high population of this pest in the absence of cotton. Of 1,791 cotton bolls examined between August 28 and September 18 only 46, or 2.56 percent, were found to be infested. These included 1 infested boll among 798 examined at Isabela, 1 among 200 examined at Quebradillas, and 44 among 793 bolls at Camuy. The heaviest infestations so far found are at Camuy. Three fields examined there showed no pink boll worms, but the other two fields showed 5 percent and 12.3 percent infestations on September 18. Five wild cotton trees (about 10 feet high) bearing green and open bolls were found about 6 miles from Corozal (toward Orocovis). An examination of 21 green and 75 open bolls on August 22 revealed no pink boll worms, but an exit hole from a green boll, an empty pupa case, and some feeding signs in open bolls indicated the presence of this insect. Inspections of other malvaceous plants for the pink boll worm have so far been negative.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Illinois. W. P. Flint (October 22): There was a moderate flight of adults during the week of October 15.

Michigan. R. Hutson (October 2): The moth appeared much earlier than usual this year. Repeated reports of damage to peaches and everbearing strawberries have come from Hillsdale, Jackson, Berrien, and Ottawa Counties. The damage has not been so severe as in many other years.

Iowa. H. E. Jaques (October 21): Adults of the cotton leaf worm have been fairly abundant, causing the usual damage to fall fruit.

Oklahoma. C. F. Stiles (October 27): Adults are being caught in large numbers in flytraps on the college campus at Stillwater. Reports from Tillman County state that they are still doing considerable damage.

Puerto Rico. L. C. Fife (October 2): Observations made September 27 showed that mature larvae and pupae were quite numerous on cotton plantings at Aguadilla (Barrio San Antonio). Many of the farmers on the northern coast found it necessary to spray from two to four times during the season. This insect has been the most important cotton pest observed during the past 2 months and the only one for which artificial control methods have been used by the growers.

## COTTON INSECTS (Hemiptera)

Arizona and California. L. D. Christenson (October 8): George J. Harrison, Agronomist of the Bureau of Plant Industry, in charge of the cotton investigations at Shafter, Calif., who visited the field station at Buckeye, Ariz., stated that in the San Joaquin Valley of California this season it was almost impossible to conduct work in cotton-breeding plots because of unusual populations of Lygus spp. and pentatorids. He thinks that the cotton production in California, especially in the Shafter and San Joaquin areas, will be very much lower this season because of these insects. After viewing conditions in the vicinity of Buckeye, Mr. Harrison was of the opinion that the cotton insect conditions there and in California were very similar.

Puerto Rico. L. C. Fife (October 2): A number of stink bugs have been collected on cotton, okra, and Hibiscus. About 10 percent of the cotton bolls show some injury by pentatorids.

COTTON APHID (Aphis gossypii Glov.)

Puerto Rico. L. C. Fife (October 2): This insect occurs throughout the northern cotton plantings and the population density varies considerably in different fields. It was found to be most numerous in cotton fields at Isabela, but parasites and predators were also numerous.

## FOREST AND SHADE-TREE INSECTS

FALL WEBWORM (Hyphantria cunea Drury)

Vermont. H. L. Bailey (October 23): Fall webworms have been much less plentiful than for several years past.

Connecticut. W. E. Britton (October 23): Nests of the fall webworm are much less abundant this year than for several seasons past.

Illinois. W. P. Flint (October 22): The fall webworm was more abundant than has been the case for a number of seasons, feeding being very general over all the central and northern parts of the State.

Nebraska. M. H. Swenk (September 15 to 30): The fall webworm was working on elm trees in Hitchcock County on September 17.

Texas. H. J. Reinhard (October 22): The fall webworm was more abundant than usual in Brazos, Burleson, Gires, and Madison Counties. The nests were most commonly noted on pecan.

GIPLY MOY (Porthetria dispar L.)

Vermont. H. L. Bailey (October 23): New infestations were reported at Essex in Chittenden County, and at Derby, in Orleans County. These localities



are far removed from the generally infested area in the Connecticut River Valley.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Virginia. N. R. Hunt (October 23): Bagworms seem to be more abundant than usual around Clarendon, perhaps because evergreens are getting more numerous in home plantings.

Alabama. J. M. Robinson (October 23): Bagworms continued to be active generally over Alabama.

PIGEON TREMEX (Tremex columba L.)

Ohio. T. H. Parks (October 17): Adults were received during October from Knox and Montgomery Counties, with the statement that they were taken on maple trees and were so common on hickory trees as to cause their death. It is our belief that they were attacking hickory trees already injured.

Nebraska. M. H. Srenk (October 30): A specimen was sent in on October 11 from Lincoln County, where they were attacking elm trees.

LONG-HORNED BEETLES (Cerambycidae)

South Dakota and Nebraska. N. D. Wygant (September): A species of Prionus was found killing quite a few green ash (Caragana) and honeylocust seedlings in the Plains Shelterbelt Nursery at Pierre, S. Dak., early in September. Tylonotus bimaculatus Hald. is quite common and abundant in the old green ash tree claims and farmstead plantings from 40 to 50 years old in central Nebraska and South Dakota. The trees attacked by this insect die branch by branch, starting at the top.

BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

Maine. H. B. Pierson (October): A light outbreak of the felted beech scale has been found on Mount Desert Island.

CATALPA

CATALPA LEAF MINER (Agropyza citreifrons Mall.)

Ohio. J. S. Houser (August 31): Catalpa leaves submitted by a correspondent show as much as one-third of the leaf occupied by the mines of the Catalpa leaf miner.

FIR

AN APHID (Dreyfusia piceae Ratz.)

New York. H. J. MacAloney (October): This aphid has been found in New York



State south of a line from Minerva to Poland (about 12 miles north of Utica). This is somewhat in line with the northern limit of infestation in Vermont and New Hampshire. The infestation has been present in some areas for several years and in some localities it is heavier this year than last.

### MAPLE

#### GREEN-STRIPED MAPLE WORM (Anisota rubicunda Fab.)

South Carolina. W. C. Nettles (October 23): The green-striped maple worm has defoliated silver maples for the third time this season near Easley.

#### GLOOMY SCALE (Chrysomphalus tenebricosus Corst.)

South Carolina. F. Sherman (October 23): The gloomy scale reported as killing many maple trees in Greenville.

#### OBSCURE SCALE (Chrysomphalus obscurus Corst.)

Tennessee. G. M. Bentley (October 25): C. obscurus on maple trees are at this time producing living young and it has been observed that a very heavy invasion is being made on this scale by three species of the ladybird beetle-

Adalia binunctata, Hippodamia convergens Guer., and Ceratomegilla fuscilabris Muls.

### OAK

#### ORANGE-STRIPED OAK WORM (Anisota senatoria S. & A.)

Maryland. E. N. Cory (September 26): A larva was found on scarlet oak at Hyattsville.

#### OAK TWIG PRUNER (Hyperallus villosus Fab.)

Connecticut. W. E. Britton (October 23): This insect has apparently been rather scarce this year on oak and other trees. It is much less common than usual.

#### OAK ROSETTE GALL (Cynips frondosa Bass.)

Maryland. E. N. Cory (September 27): The oak rosette gall was attacking oak at College Park.

#### GOLDEN OAK SCALE (Asterolecanium variolosum Ratz.)

New York and New Jersey. E. P. Felt (October 23): Golden oak scale has been reported as occurring somewhat abundantly on oaks at Great Neck, N. Y., and in northern New Jersey.

## PINE

### AN ENGRAVER BEETLE (Ips calligraphus Gerr.)

Maine. H. B. Peirson (September 28): A large white pine at Fryeburg is practically dead and heavily infested with these bark beetles. Good-sized pitch tubes were abundant on the trunk, hence beetles were an important factor in causing the death of the tree.

### INTRODUCED PINE SAWFLY (Diorion simile Htg.)

Ohio. E. W. Mendenhall (October 2): Pine sawflies are injuring pine trees on private properties at Newark.

### WHITE-PINE APHID (Cinara strobis Fitch)

Connecticut, New York, and Pennsylvania. E. P. Felt (October 23): The white-lined plant louse (Dilachnus strobis) has been unusually abundant and is depositing its rows of shiny, black eggs on white pine needles in the vicinity of Stamford, Conn., Long Island, N. Y., and in the Philadelphia, Pa., area.

### AN APHID (Ilachnus torrentosus Villers)

Connecticut and Pennsylvania. E. P. Felt (October 23): A serious plant louse infestation on Mugho pine occurred on a few plants at North Stamford, Conn., the insect being tentatively identified as Schizolachnus torrentosus. Apparently this insect occurs in the Philadelphia area.

### A SCALE INSECT (Matsucoccus matsuurae Kuwana)

Connecticut. G. H. Plumb (September 18): The current season's growth of pitch pine at Chaplin is from thickly to sparsely covered with young larval skins. Many twigs have been killed. Last year's growth exhibits similar injury.

### A TREE MIDGE (Cecidomyiidae)

Idaho. J. C. Evenden (September): An unidentified tree midge is killing a large percentage of ponderosa pine tips in northern Idaho. The adult midge deposits her eggs at the bases of needle fascicles by forcing them into the soft tissue of the current season's growth and, upon hatching, the larvae excavate small pits in which they feed. As many as 35 midge larvae were found in a 4-inch lateral tip. Usually only 1 larva was found at the base of each fascicle, but sometimes 2 or 3 were present in one pit.

## POPLAR

### A NOTODONTID (Cerura cinerea Walk.)

Ohio. J. S. Houser (September 5): This striking caterpillar, both in form and color, is damaging the foliage of Populus simoni on ornamental plantings at

Lima. It was also found in a nursery near Lima on P. simoni and on P. nigra italica. One larva was found on Salix sp. at McGuffey. The larvae at Lima ranged in size from very small to full-grown individuals. The larger larvae were heavily parasitized by tachinids.

COTTONWOOD LEAF MINER (Zeugophora scutellaris Suffr.)

Nebraska. M. H. Swenk (September 15 to 30): On September 30 a report was received from Sioux County, stating that the leaves of some cottonwood trees there were badly infested.

A LEAF MINER (Proleucoptera albella Chamb.)

California. S. Lockwood (October 2): This leaf miner has been responsible for serious, almost complete, defoliation of cottonwood trees in Kern County. This is the first record of this pest in California.

SPRUCE

WHITE SPRUCE SAWFLY (Neodiprion polytorum Htg.)

Vermont. H. L. Bailey (October 23): Serious infestation of the European spruce sawfly at Wilmington, in Windham County.

Connecticut. R. B. Friend (October 22): To date this insect has been found on Norway spruce in the following localities: Kent, West Hartford, Orange, Morris, West Hartland, and Middlebury. In only one area, Kent, have the trees been completely defoliated, and there only a few trees were involved. This defoliation occurred in 1934.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Nebraska. M. H. Swenk (September 15 to 30): The walnut caterpillar was reported as defoliating walnut trees in Douglas County on September 25.

WILLOW

A LEAF BEETLE (Monocesta coryli Say)

Alabama. J. M. Robinson (October 23): This leaf beetle was very active at Langdale, in Chambers County, causing considerable damage to the foliage of weeping willows.



INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

CUBAN-LAUREL THRIPS (Gynaikothrips uzeli Zimm.)

Florida. J. R. Watson (October 23): Cuban-laurel thrips were sent in from Sarasota where they were a serious pest of Ficus.

AN ANT (Lasius claviger Roger)

Kentucky. W. A. Price (October 24): Swarmed out of lawns in Louisville in great numbers early in October.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. H. Gladney (October 23): Six known infestations on mimosa, citrus, and pittosporum at Ocean Springs. Ladybird beetles have been established at all of the infestations.

CHRYSANTHEMUM

CITRUS MEALYBUG (Pseudococcus citri Risso)

Mississippi. C. Lyle (October 23): Mealybugs are reported numerous on chrysanthemums at Grenada by inspector N. L. Douglass, and inspector F. A. Smith reports light infestations at Oxford and Holly Springs.

DEODAR

DEODAR WEEVIL (Pissodes deodarae Hopk.)

Alabama. J. M. Robinson (October 23): The ornamental cedar deodara is being attacked by what seems to be this weevil. The trees in Auburn and at Uriah and other places in the State are seriously affected.

CRAPEMYRTLE

CRAPEMYRTLE APHID (Myzocallis kahawaluokalani Kirk.)

Mississippi. C. Lyle and assistants (October 23): Aphids on crapeyrrtle are reported to be abundant and general throughout Bolivar, Washington, and Sunflower Counties. Light to medium injury in central Mississippi.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Mississippi. Jack Milton (October 23): The euonymus scale is very abundant at Canton and Jackson, where many plants have been seriously injured.

LAUREL

A EUCOSMID (Polychrosis rhoifructana Kearf.)

New York. E. P. Felt (October 25): Seed heads of laurel (Kalmia latifolia) were received from Long Island, accompanied by a statement that most of the seeds were infested by an insect, probably this species.

LILIES

AN APHID (Rhopalosiphum nymphaeae L.)

Nebraska. H. H. Swenk (September 15 to 30): The waterlily aphid was complained of as working on lily pads in a pool in Lincoln County on September 21.

I N S E C T S   A T T A C K I N G   M A N   A N D

D O M E S T I C   A N I M A L S

MAN

ANTS (Formicidae)

New England. J. V. Schaffner, Jr. (October 19): Carpenter ants have caused a great deal of worry to property owners this year and reports indicate considerable damage, especially in dwelling houses and camps.

HUMAN FLEA (Pulex irritans L.)

Georgia. O. I. Snapp (September 26): The human flea was fairly common at Fort Valley this summer and, with the cat and dog fleas, was involved in the heavier than usual infestation of fleas reported for this locality during the summer.

FLEAS (Ctenocephalides spp.)

North Carolina. Z. P. Metcalf (October 19): Report of a little theatre in Ayden badly infested with cat fleas (C. felis Bouche) and dog fleas (C. canis Curt.), and bedbugs (Cimex lectularius L.), the first report of this kind I have ever received.

CRICKETS (Gryllidae)

Maryland. E. M. Cory (October 8): Crickets are present in a house at La Plata.

Virginia. J. L. Webb (October 31): An outbreak of Gryllus domesticus L. occurred at Lyon Park in September and continued into October. Enormous numbers bred in a public dump and invaded residences for a radius of two

or three blocks. Considerable damage was done to silk, rayon, and woolen clothing. Housewives reported that it was not unusual to sweep up as much as a quart of crickets per day within a house.

A DEER FLY (Chrysops discalis Will.)

Utah. E. C. Cushing (October 24): George Bagley, National Park Service, Washington, D. C., states that reports reaching him from a C. C. C. camp at Corinne, Utah (Locomotive Springs), indicate that 33 cases of tularemia have resulted from the bites of this species. There were no fatal cases.

BLACK WIDOW SPIDER (Latrodictus ractans Fab.)

Illinois. W. J. Spicer (October 4): There has been a slight infestation of black widow spiders near Pittsfield this summer. One woman was bitten and another killed, according to reports. Pipe-line workers in this area reported seeing about 50 of these spiders when laying pipe from Springfield, Ill., to the Mississippi River, according to a local druggist, who has one of the spiders on exhibition in his window. The school principal at Barry had 4 of these spiders brought in to him.

Kentucky. W. A. Price (October 24): The black widow spider continues to be an object of much concern in the State. They are abundant and widely distributed. Many specimens have been received from all sections of the State.

Tennessee. G. M. Bentley (October): The black widow spiders continue to be very common in all parts of the State. Many persons have been bitten and hospital attention has been necessary. No fatalities, however, have been reported.

North Dakota. J. A. Munro (October 22): On October 8 Ross Cook, county agricultural adjutant agent at Fort Yates reported the black widow spider as being in the basements of houses.

Utah. G. F. Knowlton (October 14): Several black widow spiders, collected in basements at Logan, have been brought into the Station laboratory this summer. Reports relative to its occurrence in basements and barns have been received from various sections of Utah.

California. A. F. Howland (September 21): Eighty-three black widow spiders (both sexes) were killed in the play yard of a private nursery school at Alhambra.

PAJAROELLO (Ornithodoros coriaceus Koch)

California. O. G. Babcock (October 24): These ticks were reported to be present all summer from Monterey to Hueneme.



CATTLE

SCREW WORMS (Cochliomyia spp.)

General. E. C. Cushing (September): As a result of shipments of infested animals from the South into the Northern States, the screw worm fly (C. americana Cushing & Patton) gained a foothold in southwestern Illinois and Iowa, and in eastern Missouri. (October 26): New records of the occurrence of this species have been received from California, Kentucky, New Mexico, and Arizona.

Illinois. W. P. Flint (October 22): W. J. Spicer, of the Bureau of Entomology and Plant Quarantine, and J. H. Bigger, field entomologist, State Natural History Survey, Urbana, have located several scattered infestations in Sangamon, Pike, Morgan, Adams, Fulton, and probably some other counties.

Missouri. L. Haseman (October 28): Screw worm larvae were collected by W. J. Spicer during October, both in northeast and in southwest Missouri.

Oklahoma. F. A. Fenton (October 19): The rate of spread of the screw worm across the State has slowed down, owing to cooler weather, but nevertheless the pest spread into more northern counties and there was an increase in the number of cases reported, especially around Stillwater and Payne Counties.

California. O. G. Babcock (October 24): C. americana is causing a number of infestations in the vicinity of Wasco and Bakersfield. Cochliomyia spp. are present and active also in the vicinity of Paso Robles.

STABLE FLY (Stomoxys calcitrans L.)

Utah. G. F. Knowlton (October 15): The stable fly has been moderately abundant throughout northern Utah this season.

Florida. W. G. Bruce (October 24): Stable flies were observed as being pestiferous, but not abundant, in the north-central counties.

Kansas. H. R. Bryson (September 25): Stable flies were exceptionally abundant and very annoying to livestock, especially cattle and work horses in the field. Dr. Kelly believes this increased abundance is due in part to the straw washed up in piles by the floods during May and June.

HORN FLY (Haematobia irritans L.)

Florida. E. W. Berger and G. B. Merrill (October 22): An apparently unusual attack of horn fly was noted on cattle on the eastern outskirts of the city on October 13.

W. G. Bruce (October 24): Horn flies were very abundant in all counties but more especially in Taylor, Lafayette, Union, Bradford, Alachua, Levy, and Dixie Counties.

## MOSQUITOES (Culicinae)

Florida. W. V. King (September): The recent heavy storms have produced very favorable conditions for mosquito breeding, particularly in the Everglades, notorious as a breeding place for the "spotted-legged" mosquito (Psorophora columbiae D. & K.). Around Lake Okeechobee several deaths of animals have been reported as being due to the unusual abundance of this species.

## BLACK HORSE FLY (Tabanus atratus Fab.)

Texas. K. Dorrard (October 24): This species has been giving the ranchmen who have pastures in pine woods in Montgomery and Walker Counties a great deal of trouble during the last month or two. They seem to attack cattle in the woods much more than they do those on the prairie. Many of the ranchmen anticipate an increase in number of screw worm cases following the bites of these flies.

## GULF COAST TICK (Amblyomma maculatum Koch)

Florida. W. G. Bruce (October 24): In a survey of Baker, Columbia, Madison, Hamilton, Taylor, Lafayette, Suwannee, Union, Bradford, Alachua, Gilchrist, Levy, Dixie, and Marion Counties it was found that in those areas where a large acreage of land was under water, following the hurricane early in September, there was a marked decrease in the number of infestations from this tick.

## HOUSEHOLD AND STORED-PRODUCTS INSECTS

### TERMITES (Reticulitermes spp.)

Connecticut. N. Turner (October 23): Several large dwellings in Manchester were attacked, the damage ranging from \$3,000 to \$7,000. All were within two city blocks. Apparently every building was susceptible and infested, several showing structural damage.

Illinois. W. P. Flint (October 22): Termite infestations are being reported daily. An unusual situation has come up on the University Farm at Urbana. In this instance termites have infested one edge of a field of standing corn, going in for 10 to 14 rows. The 4 outer rows in the field were injured so that practically all of the corn has fallen. The damage becomes gradually less towards the center of the field.

Alabama. J. M. Robinson (October 23): Termites are active at Auburn and generally over the State.

Iowa. H. E. Jacques (October 21): Termites are reported doing damage at Danville and West Burlington.

Oklahoma. C. F. Stiles (October 23): Numerous requests are being received from over the State for assistance in termite control.

RICE WEEVIL (Sitophilus oryzae L.)

Alabama. J. M. Robinson (October 23): The rice weevil is moderately abundant in fields.

Mississippi. C. Lyle and Assistants (October 23): Weevils are very numerous in corn just being harvested and still in the field.

PEA WEEVIL (Bruchus pisorum L.)

South Carolina. W. C. Nettles (October 23): Complaints have been received from many parts of the State.



OCTOBER 1935

Vol. 15

Supplement

No. 9

## REPORT ON STATUS OF THE EUROPEAN CORN BORER IN 1935

By A. M. Vance, Associate Entomologist  
Division of Cereal and Forage Insect Investigations  
Bureau of Entomology and Plant Quarantine  
U. S. Department of Agriculture

A survey to determine the status of the European corn borer, as regards degree of infestation, in 1935, over much of the infested territory, was conducted by the Bureau of Entomology and Plant Quarantine from August 16 to September 15 in the one-generation area, and from September 3 to 30 in the two-generation area. It was directed from the laboratory for European corn borer research at Toledo, Ohio, W. A. Baker in charge. This work was carried out essentially as planned and resulted in the examination of 1,900 cornfields, taken at random on a county or county-group basis, within 135 counties in Michigan, Indiana, Ohio, Pennsylvania, New York, Vermont, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, Maryland, and Virginia. Sixteen experienced men, working singly, were engaged in the field work and traveled a total of 37,760 miles during the survey.

The Conservation Department of Indiana and the State Department of Agriculture in Maine cooperated actively in the surveys in their respective States.

Field methods, previously proved satisfactory for supplying corn-borer abundance data adequate for comparisons between counties and county groups for one or more years, were employed. Generally, the counties situated in the older infested portion of the area were considered separately, and in each a total of 20 random fields were surveyed. In the more lightly infested sections the counties were combined in groups of 2 to 5, and in each group a total of 30 or 40 random fields were surveyed. The percentage of plant infestation was determined by a count of 100 plants in each field, and the average number of borers per infested plant was found by a dissection of 10 infested plants in each field of a county unit, and of 5 infested plants in each field of a county group.

The accompanying tables and maps show the status of the European corn borer in 1935 in comparison with its abundance in recent years.

In the one-generation area a very definite increase in corn-borer infestation occurred in 1935, over that of 1934, in southeastern Michigan, northeastern Indiana, and the northwestern quarter of Ohio, in decided contrast to the rather general decrease found in the same sections in 1934, as compared with 1933.

The territory in Michigan, Indiana, and Ohio which showed an increase in 1935 over 1934 comprised 50 (or 67.6 percent) of the 74 counties surveyed in that part of the one-generation area. In 19 of the other counties included, the survey revealed no change in the corn-borer population from that of last year, and in one group of 5 counties in northeastern Ohio there was a decrease in infestation. In the same territory in 1934 only 1 county, the data on which were comparable with those of 1933, showed an increase over the previous year, while all other counties or county groups surveyed either exhibited no appreciable change or showed a significant decrease.

In Michigan, one of the most outstanding increases of the corn borer in 1935 occurred in the northern part of the "thumb", in the Genesee-Huron-Sanilac-Tuscola County group, where the average number of borers per 100 plants showed a nine-fold increase from 15.6 in 1934 to 142.7 in 1935. Of the 40 fields surveyed in this section, 23 (or 57.5 percent) had average populations of over 100 borers per 100 plants; 10 (or 25 percent) had over 200 borers per 100 plants; 3 (or 7.5 percent) had over 300 borers per 100 plants; and one field had a maximum of 413 borers per 100 plants.

The most significant increase in Indiana was found in the Allen-DeKalb-Steuben County group, in the extreme northeastern corner of the State, where the average number of borers per 100 plants in 1935 was 27.8, or  $3\frac{1}{2}$  times as great as the average of 7.7 recorded in the same region in 1934. Infestation was apparent in the counts made in all 40 fields of this group, and a maximum of 142.8 borers per 100 plants was found in one field.

A considerable rise in infestation was apparent in the northwestern quarter of Ohio, where half of the counties surveyed fell within a zone of increase. As in previous years, the most heavily infested section in 1935 seemed to follow the old lake bottom land extending in a southwesterly direction from the western end of Lake Erie. The highest infestations were found in Lucas and Wood Counties, which had averages of 121.5 and 91.2 borers per 100 plants, respectively. In Paulding, Putnam, and Sandusky Counties the borer populations were 12 times as great as those found in 1934, and in several of the more southern county groups the comparatively low infestation of 1934 had grown appreciably. Relatively light infestation continued in the eastern part of the surveyed area in Ohio.

The infestation in 1935 tended to remain about the same as in 1934 in a group of 3 counties in northwestern Pennsylvania, and in 8 counties of western New York, with significant decreases appearing in 5 counties immediately south of Lake Ontario. In the Albany, N. Y., section there was an increase this year over last.



Centre County in Pennsylvania was included in the survey in 1935 for the first time. An average of 22.5 borers per 100 plants was observed for the county, with most of the infestation occurring in its eastern and southeastern parts where average populations of 231 and 277 borers per 100 plants were found in two of the fields surveyed.

In Vermont, the figures on infestation in 1935 are not directly comparable with those obtained in 1934 because of a variation in the portion of the State included in the survey. The data for 1935 showed an average of 32.3 borers per 100 plants for the western part of Vermont. The heaviest concentrations of the insect were found in the extreme northern portion of the surveyed area where 4 fields contained average populations of between 100 and 350 borers per 100 plants.

Seasonal conditions in 1935 were apparently very favorable to corn-borer development in the western portion of the one-generation area and were undoubtedly responsible for the general building up of infestation from the low levels of 1934. An increase, such as found this year, emphasizes the potential of the European corn borer under favorable conditions. The decrease or lack of change of the infestation evident in northwestern Pennsylvania and western New York, in 1935, is not now explicable. Corn debris was scarce in western New York last spring, and possibly there occurred a considerable reduction of overwintering borers as a result of a greater utilization of crop material for livestock feed following the droughty conditions of 1934.

In the two-generation area, the 1935 survey revealed no significant changes in infestation from 1934 in Massachusetts and Rhode Island, or in New Haven County, Connecticut, although a trend toward increase was apparent in the eastern tier of counties in Massachusetts.

Significant increases in infestation were found in the Strafford-Rockingham County group, New Hampshire; in Hartford and Middlesex Counties, Connecticut; in Suffolk County, New York; and in Monmouth County and the Atlantic-Burlington-Ocean County group, New Jersey. A decrease appeared in New London County, Connecticut.

Southeastern New England and eastern Long Island continued to be the center of heaviest borer concentrations. Extremely high populations of the insect were found in 1935 in Hartford, New Haven, and Middlesex Counties, Connecticut, and in Suffolk County, New York, where the average numbers of borers per 100 plants per respective county were as follows: 721.4, 469.2, 415.8, and 595. In 23 (or 38.3 percent) of the 60 fields surveyed in the above-named three Connecticut counties the average was more than 500 borers per 100 plants, and in 9 (or 15 percent) of the fields the average exceeded 1,000 borers per 100 plants, including a maximum of 2,340 borers per 100 plants in one field in New Haven County. In 9 (or 45 percent) of the 20 fields surveyed in Suffolk County, New York, the average number of borers per 100 plants was over 500, and in 4 (or 20 percent) of the fields it exceeded 1,000 per 100 plants.



The continued increase in corn-borer populations in New Jersey, and the extent of infestation found on the "Eastern Shore" of Maryland and Virginia, where a survey was made this year for the first time, are of particular interest because of the possible reactions of the insect in its spread southward to new environments.

In New Jersey, 46 fields (or 76.6 percent) of the 60 fields surveyed in 1935 showed infestation by the borer as compared with 18 (or 45 percent) of the 40 fields examined in the same counties in 1934. The heaviest infestations continued to be in Monmouth and Ocean Counties, where 6 of the fields this year contained populations of over 100 borers per 100 plants, with a maximum of 326 per 100 plants in one field.

Most of the infestation in the Wicomico-Worcester County group, Maryland, was confined to Worcester County. Eleven (or 36.7 percent) of the 30 fields surveyed in the two counties were found infested with the European corn borer. The average numbers of borers per 100 plants in the four highest fields were as follows: 87, 67.2, 55.1, and 42.1.

The infestation in the Accomac-Northampton County group, Virginia, occurred largely in the upper two-thirds of the section. Twenty-five (or 83.3 percent) of the 30 fields surveyed were infested by the European corn borer. The average numbers of borers per 100 plants in the four highest fields were as follows: 68, 66.1, 43.2, and 42.9.

Table 1. Data on infestation of the European corn borer in the fall of 1935 and comparisons with figures for 1932, 1933, and 1934

One-Generation Area

Michigan

<u>County or County Group</u>	<u>Average number of borers per 100 plants</u>			
	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
Lenawee	50.0	32.0	13.3	56.4
Macomb	72.6	16.4	20.9	45.9
Monroe	72.7	62.8	27.6	42.9
St. Clair	20.8	15.7	11.8	57.3
Washtenaw	49.7	16.4	2.7	19.5
Wayne	59.7	35.8	7.7	7.2
Lapeer-Livingston-Oakland	24.8	14.0	3.7	23.5
Genesee-Huron-Sanilac-Tuscola	40.2	--	15.6	142.7
Hillsdale-Ingham-Jackson	13.3	--	1.2	16.1
Regional averages				
Based on first 7 counties and county groups	50.0	27.6	12.5	36.1
Based on all counties and county groups	44.9	-	11.6	45.7

Ohio

Defiance	12.8	12.6	8.1	4.8
Fulton	46.2	53.7	30.1	41.0
Hancock	53.8	36.5	25.9	38.8
Henry	52.7	58.8	10.4	44.7
Lucas	49.8	181.2	22.7	121.5
Ottawa	49.7	70.7	22.5	25.9
Paulding	30.5	6.5	3.0	42.1
Putnam	48.0	15.0	3.1	37.6
Sandusky	66.3	71.7	3.8	48.6
Seneca	46.6	6.5	16.7	27.9
Williams	27.1	34.1	2.5	9.2
Wood	66.5	92.5	47.6	91.2
Allen-Auglaize-Mercer-Van Wert	19.5	7.1	8.4	29.2
Crawford-Wyandot	13.2	14.0	1.5	13.7
Erie-Huron-Lorain	20.0	13.6	10.2	9.3
Ashland-Knox-Morrow-Richland	4.1	-	2.7	3.8
Delaware-Hardin-Marion-Union	17.4	-	7.1	36.3
Champaign-Darke-Logan-Miami-Shelby	7.0	-	5.0	12.9
Clark-Fayette-Greene-Madison-Montgomery	0.8	-	0.3	0.5
Medina-Portage-Stark-Summit-Wayne	2.8	-	5.7	2.4

Regional averages

Based on first 15 counties and county groups	40.2	45.0	14.4	39.0
Based on all counties and county groups	31.7	-	11.9	32.1

## Indiana

<u>County or County Group</u>	<u>Average number of borers per 100 plants</u>			
	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
Allen-DeKalb-Steuben	6.6	11.8	7.7	27.8
Adams-Blackford-Jay-Wells	0.6	-	0.3	2.3
Delaware-Henry-Randolph-Wayne	0.2	-	0	1.2
Huntington-Moble-Whitley	1.3	-	2.6	5.9
Regional average				
Based on all county groups	2.2	-	2.7	9.3

## New York

Chautauqua	31.5	29.7	8.6	15.7
Erie	36.9	19.9	7.7	21.6
Genesee	28.7	34.8	14.3	3.2
Jefferson	157.7	41.3	50.8	48.8
Monroe	66.8	23.4	60.1	26.5
Niagara	51.9	19.2	25.3	5.9
Orleans	65.8	55.6	90.5	8.2
Oswego	159.4	31.3	32.0	40.9
Wayne	74.4	23.6	44.9	17.5
Cattaraugus	19.5	-	0.8	2.1
Livingston-Ontario-Wyoming	35.1	-	2.7	3.5
Albany-Fulton-Montgomery-Schenectady-Schoharie	71.4	-	25.4	48.1
Regional averages				
Based on first 9 counties	74.8	31.0	37.1	20.9
Based on all counties and county groups	66.6	-	30.3	20.2

## Pennsylvania

Centre	-	-	-	22.5
Erie-Crawford-Warren	-	-	2.2	1.0

## Vermont

Bennington-Rutland-Windham-Windsor	15.8	-	23.2	-
Addison-Bennington-Rutland	-	-	-	27.4
Chittenden-Grand Isle-Washington	-	-	-	37.2
Regional average	-	-	-	32.3



Two-Generation Area

Maine

<u>County or County Group</u>	<u>Average number of borers per 100 plant</u>			
	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
York	30.6	-	-	10.4
Oxford	-	-	-	2.5
Regional average	-	-	-	6.5

Massachusetts

Bristol	205.8	469.4	107.2	86.1
Essex	211.8	104.2	105.8	200.5
Middlesex	153.0	214.2	185.9	303.9
Barnstable-Norfolk-Plymouth	181.6	-	153.5	259.8
Franklin-Hampden-Hampshire-Worcester	13.0	-	40.1	20.5
Regional averages				
Based on first 3 counties	190.5	262.6	133.0	196.8
Based on all counties and county groups	153.2	-	118.5	174.2

Rhode Island

Bristol-Newport	190.0	326.3	172.3	150.1
Kent-Providence-Washington	43.8	-	61.7	71.5
Regional average	116.9	-	117.0	110.8

Connecticut

Hartford	50.7	387.4	61.3	721.4
Middlesex	31.5	153.6	318.2	415.8
New Haven	2.4	107.9	325.0	469.2
New London	76.7	49.7	135.8	44.7
Tolland-Windham	-	-	-	35.0
Regional average				
Based on first 4 counties	40.3	174.7	210.1	412.8

New Hampshire

Rockingham-Strafford	19.6	-	8.7	72.6
----------------------	------	---	-----	------

New York  
(Eastern Long Island)

Suffolk	394.4	356.5	279.6	595.0
---------	-------	-------	-------	-------

New Jersey

<u>County or County Group</u>	<u>Average number of borers per 100 plants</u>			
	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
Monmouth	0.9	-	20.4	43.4
Atlantic-Burlington-Ocean	0.1	-	3.4	33.3
Regional average	0.5	-	11.9	38.4

Maryland

Wicomico-Worcester	-	-	-	9.4
--------------------	---	---	---	-----

Virginia

Accomac-Northampton	-	-	-	18.1
---------------------	---	---	---	------

Table 2. Summary of infestation of the European corn borer by States and areas  
1932 - 1935

<u>One-Generation Area</u>	<u>Average number of borers per 100 plants</u>			
	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
Michigan	50.0	27.6	12.5	36.1
Indiana	6.6	11.8	7.7	27.8
Ohio	40.2	45.0	14.4	39.0
New York	74.8	31.0	37.1	20.9
Pennsylvania	-	-	2.2	1.0
Vermont	-	-	-	32.3
Area average (based on first 4 States)	42.9	28.9	17.9	31.0
<u>Two-Generation Area</u>				
Massachusetts	190.5	262.6	133.0	283.4
Rhode Island	190.0	326.3	172.3	150.1
Connecticut	40.3	174.7	210.1	412.8
New Hampshire	19.6	-	8.7	72.6
New York (Suffolk County)	394.4	356.5	279.6	595.0
New Jersey	0.5	-	11.9	38.4
Maryland	-	-	-	9.4
Virginia	-	-	-	18.1
Area average (based on first 3 States and Suffolk County, N. Y.)	203.8	280.0	198.8	360.3

\* All averages based only on comparable counties or county groups.

Table 3. Grouping of cornfields surveyed in 1934 and 1935 according to their borer populations

Average number of borers: per 100 plants	Percent of surveyed fields in--*					
	One-generation area			Two-generation area		
	1934	1935		1934	1935	
0	28.8	21.6	:	16.1	15.6	:
1-25	55.9	51.4	:	26.7	31.1	:
26-50	8.9	10.9	:	11.4	12.3	:
51-100	4.8	9.4	:	11.9	12.1	:
101-200	1.2	4.8	:	12.2	9.8	:
201-300	0.3	1.2	:	7.8	4.0	:
301-400	-	0.4	:	5.8	3.6	:
401-500	0.1	0.1	:	5.0	2.3	:
501-600	-	0.1	:	1.1	1.2	:
601-700	-	-	:	1.1	1.3	:
701-800	-	-	:	0.3	1.0	:
801-900	-	0.1	:	0.1	1.2	:
901-1000	-	-	:	-	1.2	:
1001-2000	-	-	:	-	2.9	:
2001-2350	-	-	:	-	0.4	:

\* The percentages for the one-generation area are based on a total of 1,240 surveyed fields in 1934 and 1,380 in 1935; those for the two-generation area are based on a total of 340 surveyed fields in 1934 and 520 in 1935.





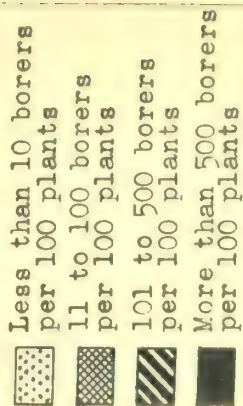
RELATIVE ABUNDANCE OF BORER OVER INFESTED  
TERRITORY SURVEYED IN 1935

Less than 10 borers  
per 100 plants

11 to 100 borers  
per 100 plants

101 to 500 borers  
per 100 plants

More than 500 borers  
per 100 plants







STATUS OF EUROPEAN CORN BORER  
IN 1935 AS COMPARED WITH 1934

Legend:

- Increase
- Unchanged
- Decrease
- No comparison

## Increase

Unchanged

Decrease

No comparison



# INSECT PEST SURVEY BULLETIN

DECEMBER 1935

---

Vol. 15

Supplement

No. 9

---

## COLONIZATION OF FOREIGN PARASITES OF THE EUROPEAN CORN BORER IN THE UNITED STATES FOR 1935

By W. G. Bradley<sup>1/</sup>, Assistant Entomologist, and  
E. W. Beck, Junior Entomologist, Division of Cereal and Forage Insects,  
Bureau of Entomology and Plant Quarantine  
U. S. Department of Agriculture

This report summarizes the progress made in 1935 in the distribution of exotic species of parasites of the European corn borer, in both the one- and two-generation areas, as a continuation of the 1934 program. Except for subordinating other considerations to the efficient handling of Inareolata punctoria Roman., the promising European ichneumonid, no change in the 1934 procedure was made. The total releases in 1935 are presented in table 1, and the total releases to December 31, 1935, since the inauguration of parasite activities, are presented in table 2.

In addition to the parasite material imported from Europe through the facilities of the Division of Foreign Parasite Introduction, a supply of Cremastus flavoorbitalis (Cam.) was made available through the cooperation of the Canadian Department of Agriculture, Entomological Branch, in continued importations of parasite material from the Orient. This species was desired particularly for release in more southern sections now infested by the borer.

---

<sup>1/</sup> D. W. Jones, C. A. Clark, and E. D. Burgess assisted in the release of the parasites in the regions of their respective assignments.



Table 1.--Summary of releases of imported parasites in 1935

State	: Lydella : stabulans var. : griseus	: Inareolata: : punctoria:	: Cremastus: : flavoor- : bitalis	: Bracon : atricornis:	Total
Connecticut----	: 1,823	: 1,138	: 771	: 7	: 3,739
Indiana-----	: 11,904	: --	: --	: --	: 11,904
Maine-----	: 1,927	: --	: --	: --	: 1,927
Massachusetts--	: 7,824	: --	: --	: --	: 7,824
Michigan-----	: 5,980	: --	: --	: --	: 5,980
New Hampshire--	: 5,569	: --	: --	: --	: 5,569
New Jersey-----	: 6,461	: 565	: 593	: --	: 7,619
New York-----	: 11,767	: 1,712	: 600	: --	: 14,079
Ohio-----	: 25,398	: 3,888	: --	: --	: 29,286
Vermont-----	: 9,813	: --	: --	: --	: 9,813
Virginia-----	: 3,956	: --	: 600	: --	: 4,556
Total-----	: 92,922	: 7,303	: 2,564	: 7	: 102,796

Table 2.--Total releases of imported parasites in United States to December 31, 1935

State	Apanteles sp. (Oriental)	Apanteles thompsoni Lyde (European)	Brachn stricornis (with) (Oriental)	Brachn stricornis (with) (European)	Campoplex multi- cinctus Grav.	Campoplex pyraustae with	Chelonus annulipes W. Sm.	Drepanus flavicornis	Eulimneria albae (Eur. & Asiat.)	Eulimneria albae (Eur. & Asiat.)	Eulophus viridulus (Oriental)	Exeristes robustator Fab.	Inareolata (European)	Inareolata punctaria Roman.	Lydella stricaria (Oriental)	Lydella stricaria var. grisea (European)
Conn.	21,260	12	2,227	1,483	889	168	17,200	2,302	3,719	1,163	31,041					
Ind.	5,700		2,257		5,161		6,671	22,905				22,921				
Maine																
Mass.	388	61,144	7,204	6,762	20,193	8,335	84,786	54,957	21,130	7,554	16,456					
Mich.		34,837	6,363		24,075		44,037	86,607	7,158							
N. H.																
N. J.					593											
N. Y.	3	51,106	4,783	1,107	9,277		55,755	40,050	14,760							
Ohio		52,505	357	5,145	36,370		101,648	87,826	27,445	8,711	193,912					
Pa.		5,774			550			20,119	707							
R. I.		11,756	123	1,014	4,636		7,446		8,534	6,038	32,034					
Vt.																
Va.				600												
Total	391	252,090	227,123	1,555	16,706	101,161	8,501	317,543	314,766	92,013	23,466	625,222				

Table 2. Total releases of imported parasites in United States to December 31, 1935 (cont'd)

State																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
-------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--







Fig. 1. Showing technique in releasing tachinids from shipping containers.

All parasites were taken to the point of release, in the containers in which they were packed for distribution at Moorestown, N. J., where all emergence was taken. Figure 1 shows the technique utilized in allowing tachinids to escape from the shipping container. A similar technique was utilized with the Hymneoptera.

In order to receive the maximum benefits from the parasite releases it is essential that these liberations be timed to synchronize the maximum oviposition period of the parasites with the optimum stage of host development to receive such ovipositions. A practical accomplishment of this synchronization is difficult for many reasons, as the following: (1) Specific information is lacking concerning the length of life and oviposition period of various species of parasites under field conditions; (2) the effect of seasonal variations in shifting the development of their host, the corn borer, under field conditions, cannot be foretold; (3) since obviously it is impossible to vary to any great extent the normal date of emergence of one species of internal parasite more than that of another after the host material has been placed in a developmental environment, this necessitates the selection for emergence that period which is optimum for the most important species expected to emerge from the material at hand.

However, all releases of corn borer parasites are timed to synchronize with the average first appearance of optimum host development, as this procedure has previously proved effective with releases; whereas, a number of past releases that have preceded or been delayed beyond this period have not proved successful. In planning the emergence schedule for 1935, major emphasis was placed on accomplishing the desired synchronization with respect to two species, namely, Inareolata punctoria from the Italian host material, for synchronization with third-instar larvae in both the one- and two-generation areas, and Cremastus flavo-orbitalis from the oriental source, for synchronization with fourth-instar hosts in Canada. Fortunately, such factors as the demands of the different parasites for varying host stages, on which to oviposit, variations in the length of the developmental period of the host, and the duration of the preoviposition period, permitted a fairly close synchronization of all parasites as well as those selected for chief consideration.

The more pertinent information bearing on the accomplishments of the 1935 colonization program are presented in the following discussions:

1. Inareolata punctoria Roman. (Ichneumonidae):

Major emphasis was placed on the optimum handling of this parasite, as it was the least widely distributed of the parasites that have been demonstrated to be the most valuable species imported to date. A total of 7,303 adults were released in 13 colonies, 12 of which were dispersion colonies and 1 a supporting test release at Milford, New Haven County, Conn. Table 3 summarizes the releases of this species and map 1 indicates the extent of colonization prior to 1935, and the counties receiving releases during that season.



Table 3.--Releases of *Inareolata punctoria* in 1935

State	Township	County	Parasites liberated	Period of release (dates inclusive)
			Number	
Connecticut--	Milford	New Haven	552	July 12
	Haddam	Middlesex	586	July 20
Total---	--	--	1,138	July 12 - 20
New Jersey---	Brick	Ocean	565	July 5
Total---	--	--	565	Do.
New York----	Berne	Albany	517	July 9
	Porter	Niagara	597	July 28
	Yates	Orleans	598	Do.
Total---	--	--	1,712	July 9 - 28
Ohio-----	Perkins	Erie	588	August 6
	German	Fulton	598	July 23
	Richmond	Huron	586	July 30
	Jefferson	Mercer	598	August 2
	Danbury	Ottawa	348	August 13
	Seneca	Seneca	583	July 30
	Willshire	Van Wert	587	August 2
Total--	--	--	3,888	July 23 - August 13
Grand total--	--	--	7,303	July 5 - August 13

The third instar of the host is preferred for parasitization by this species. In general, releases this year were delayed somewhat beyond the release date optimum for the season. The average optimum 7-day period (or the average 7-day period after the first host larvae pass into the third instar) for release of this species was found to be June 23-29 in the two-generation area (data from New England), and July 19-25 in the one-generation area (data from Ohio). The actual synchronization obtained this season, is shown in charts 1 to 4, inclusive. These charts show that 85 percent of the releases in the Middle West and those in Connecticut were made after the period of maximum host abundance had passed, but, that in northwestern New York and in New Jersey the parasites were in the field before the peak of the preferred instar. However, in all cases, except the release in Albany County, N. Y., the liberated adults should have found favorable host instars present in the field at the time of their release.

## 2. *Lydella stabulans* var. *griseszens* R. D. (Tachinidae):

A total of 92,922 adults of this species were released in 41 colonies, 39 of these being dispersion colonies. One test colony of this species was started in Atlantic Township, Monmouth County, N. J., and one in Lee Township Accomac County, Va. Table 4 summarizes the releases of this species and map 2 shows the extent of colonization prior to 1935 and the localities that received releases during that season.

Chart 1

Extent of synchronization of Inareolata punctaria releases  
in New York, with presence of preferred host stage

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

(Host data from Rochester, N. Y., Field Station)

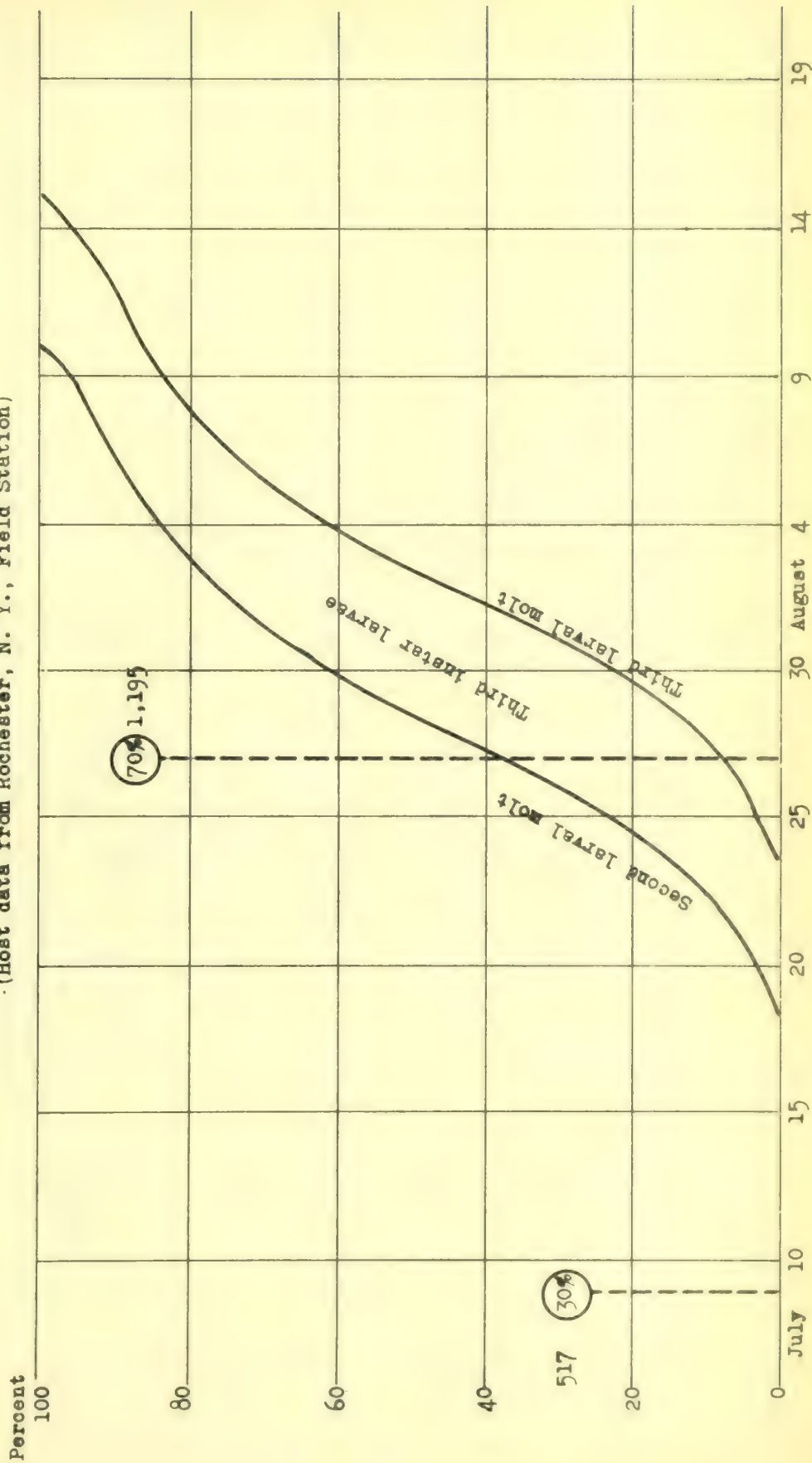


Chart 2

Extent of synchronization of Inareolata punctioria releases in Ohio, with presence of preferred host stage

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

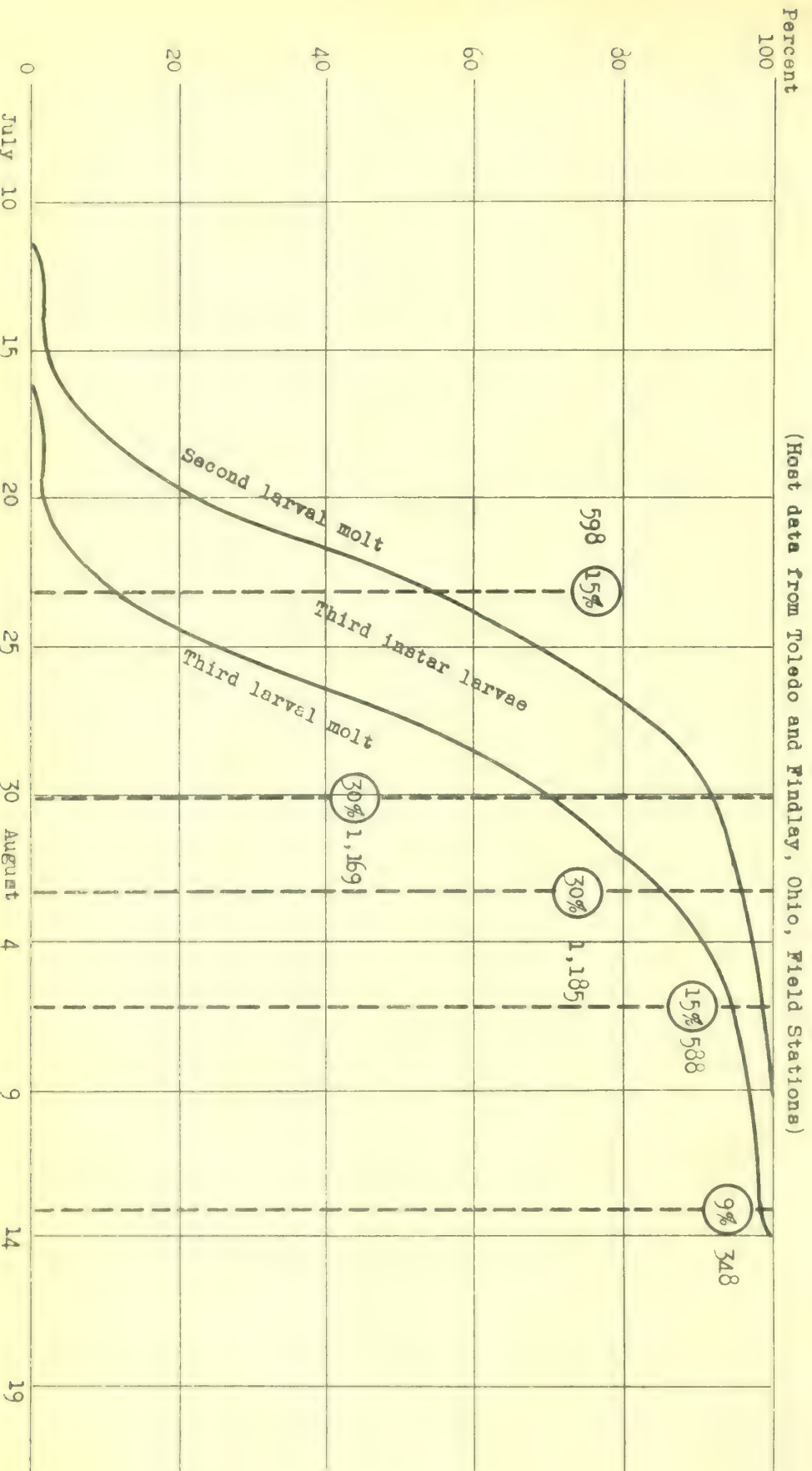




Chart 3

Extent of synchronization of *Inareolata punctatoria* releases  
with presence of preferred host stage

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

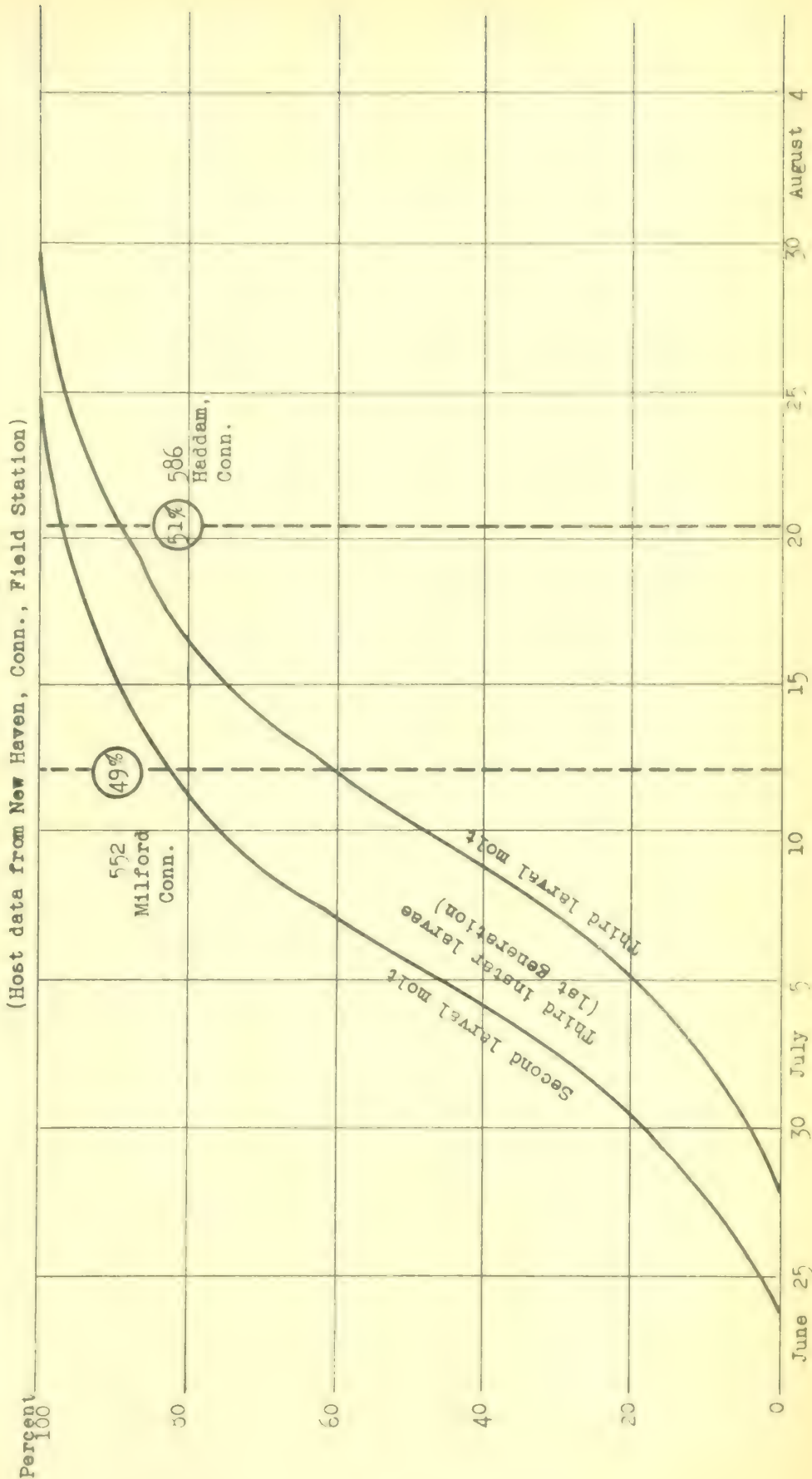


Chart 4

Extent of synchronization of Inareolata punctioria releases  
in New Jersey, with presence of preferred host stage

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

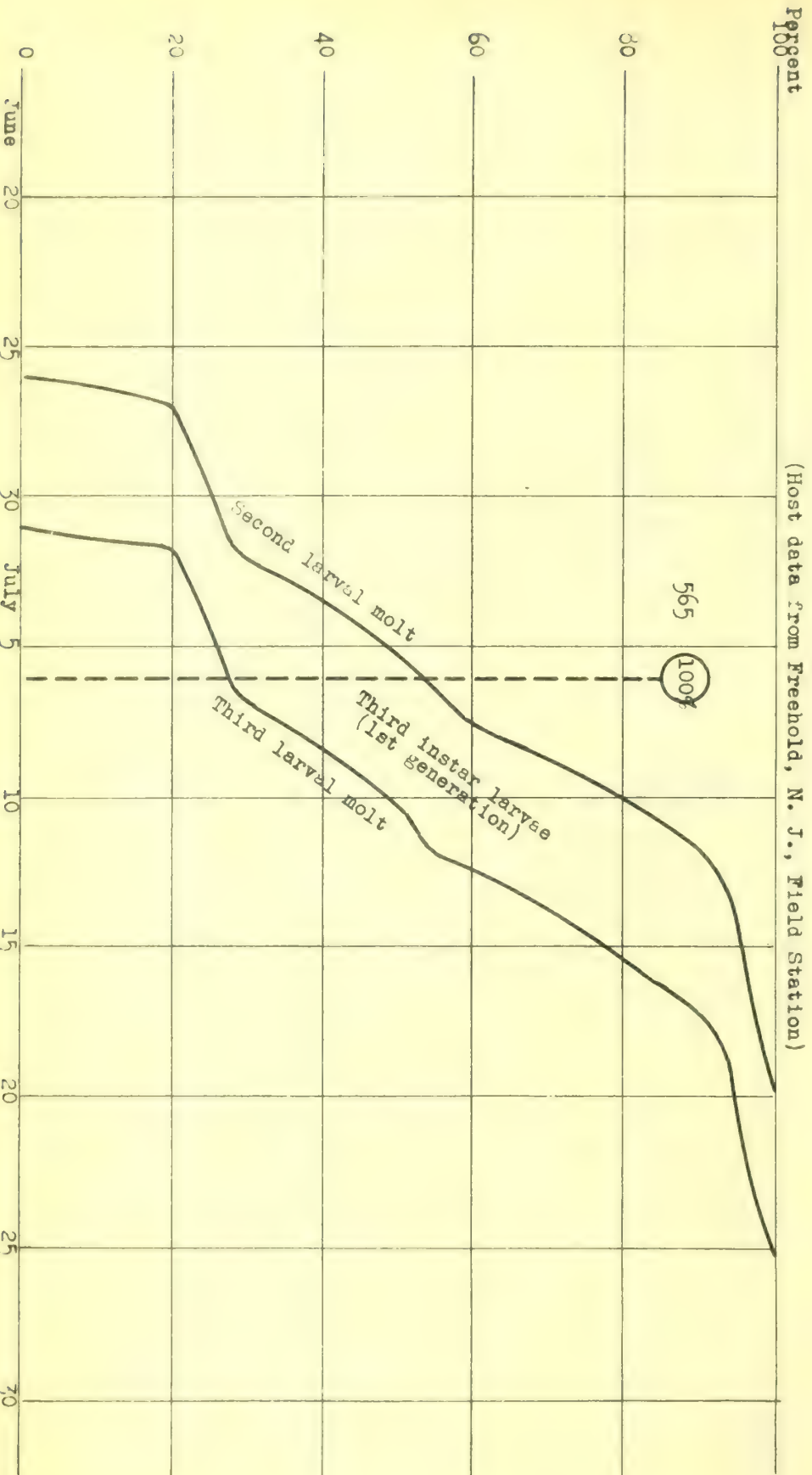


Table 4.--Releases of *Lydella stabulans* var. *grisea* R. D. in 1935

State	Township	County	Parasites liberated	Period of release (Dates inclusive)
			Number	
Connecticut---	Haddam	Middlesex	1,823	July 2
Total----	---	---	1,823	Do.
Indiana-----	Union	Adams	3,974	July 10
	Clear Creek	Huntington	3,966	Do.
	Union	Whitely	3,964	Do.
Total----	---	---	11,904	Do.
Maine-----	Wells	York	1,927	June 18
Total----	---	--	1,927	Do.
Massachusetts--	Barnardston	Franklin	1,906	July 6
	Agawam	Hampden	1,984	June 25
	Hadley	Hampshire	1,949	July 6
	Charlton	Worcester	1,985	June 25
Total----	--	--	7,824	June 25 - July 6
Michigan-----	Sebewaing	Huron	1,995	July 9
	Goodland	Lapeer	1,992	Do.
	Lexington	Sanilac	1,993	Do.
Total----	--	--	5,980	Do.
New Hampshire--	Hollis	Hillsboro	1,782	July 6
	Raymond	Rockingham	1,833	June 18
	Strafford	Strafford	1,904	Do.
Total----	--	--	5,569	June 18 - July 6
New Jersey----	Egg Harbor	Atlantic	1,997	June 17
	Woodland	Burlington	508	(*)
	Atlantic	Monmouth	1,930	June 16
	Brick	Ocean	1,976	Do.
Total----	--	--	6,461	June 16 - 17
New York-----	Berne	Albany	1,983	July 9
	Mayfield	Fulton	3,913	Do.
	Palatine	Montgomery	3,901	Do.
	Jefferson	Schoharie	1,970	Do.
Total----	--	---	11,767	Do.

\*Release point for early and late emerging individuals. Small lots.



Table 4. Releases of *Lydella stabulans* var. *grisesagens* R. D. in 1935 (Cont'd)

State	Township	County	Parasites liberated	Period of release (Dates inclusive)
			Number	
Ohio-----	Moorefield	Clark	1,991	July 19
	Liberty	Delaware	1,996	July 9
	Pike	Knox	1,995	Do.
	Avon	Lorain	1,996	July 19
	Pike	Madison	2,996	July 10
	Stokes	Madison	2,993	Do.
	Jefferson	Mercer	1,983	July 12
	Newberry	Miami	1,992	Do.
	Westfield	Morrow	1,997	July 9
	Jackson	Shelley	1,992	July 12
	Marlboro	Stack	1,976	July 6
	Canaan	Wayne	1,991	Do.
Total--	--	--	25,898	July 6 - 19
Vermont-----	Grand Isle	Grand Isle	3,960	July 17
	Poultney	Rutland	1,961	June 19
	Middlesex	Washington	1,953	Do.
	Bridgwater	Windsor	1,939	Do.
Total--	--	--	9,813	June 19 - July 17
Virginia-----	Lee	Accomac	1,977	June 15
	Franktown	Northampton	1,979	Do.
Total--	--	--	3,956	Do.
Grand total--	--	--	92,922	June 15 - July 19

This tachinid normally has a preoviposition period of from 10 to 14 days. The fourth instar is the optimum stage of the host for successful oviposition by this species, therefore, it is desirable that releases be made from 10 days to 2 weeks before borers in the field start to enter this instar. For the two-generation area this period was considered to be the week of June 20-26 and for the one-generation area the week of July 12-18. These periods were calculated from data on average seasons in New England and Ohio. The extent of synchronization of parasites with their preferred hosts and the extent to which the 1935 season approached the average is presented in charts 5 to 9, inclusive. These charts show that releases in practically all cases were nearly ideal. The 3,960 adults released at Grand Isle, Vt., (Chart 7), would probably synchronize very well with the single-generation larvae that normally occur there.

### 3. *Cremastus flavoorbitalis* (Cameron) (Ichneumonidae):

Five colonies of this parasite were released in the more southern parts of the two-generation area, including one at each of the test points in Connecticut, New Jersey, and Virginia. Table 5 summarizes the releases

# Chart 5

Extent of synchronization of Lydella stabulans var griseus releases  
with presence of preferred host stage. Vicinity of Albany, N. Y.

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

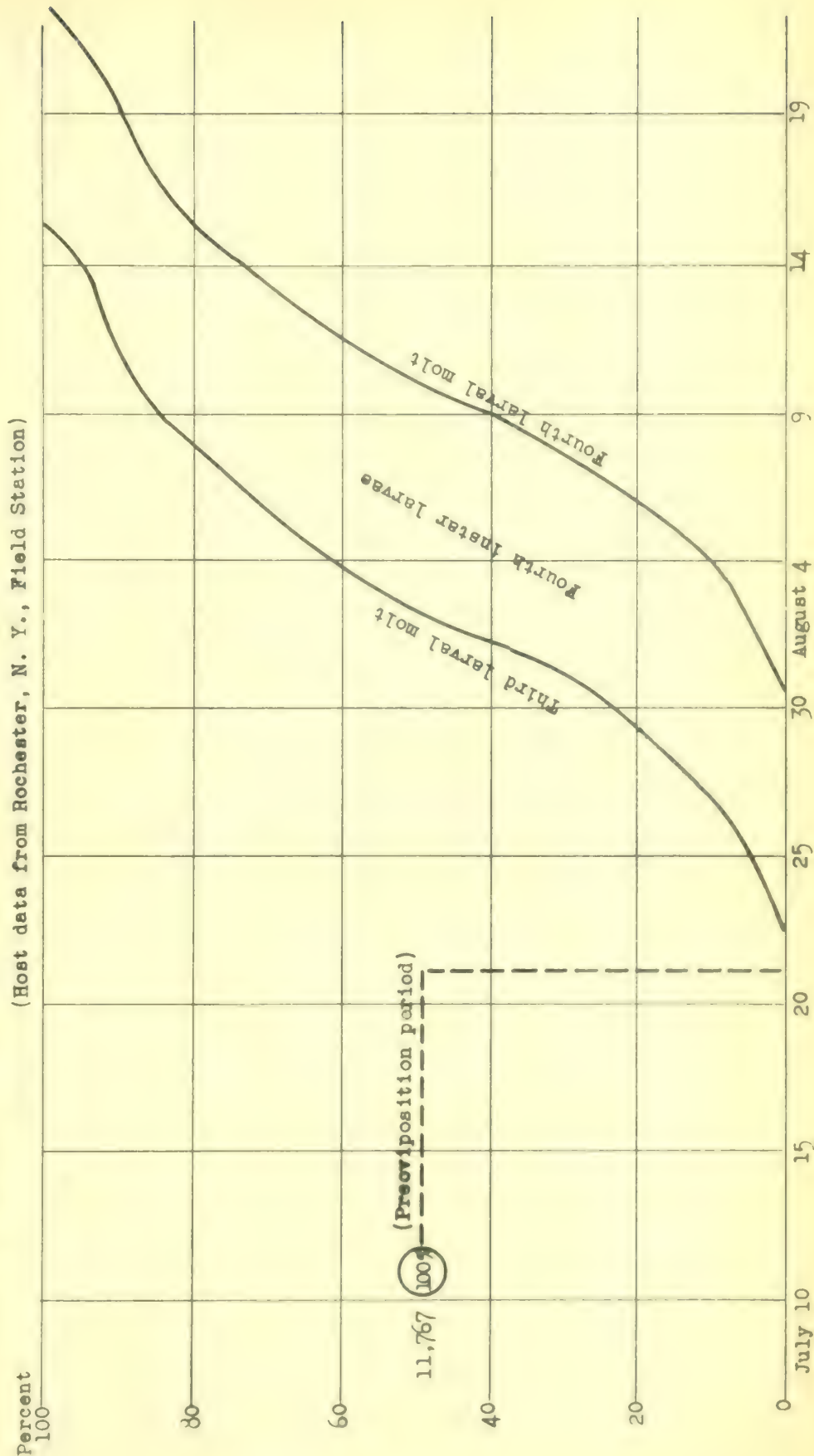
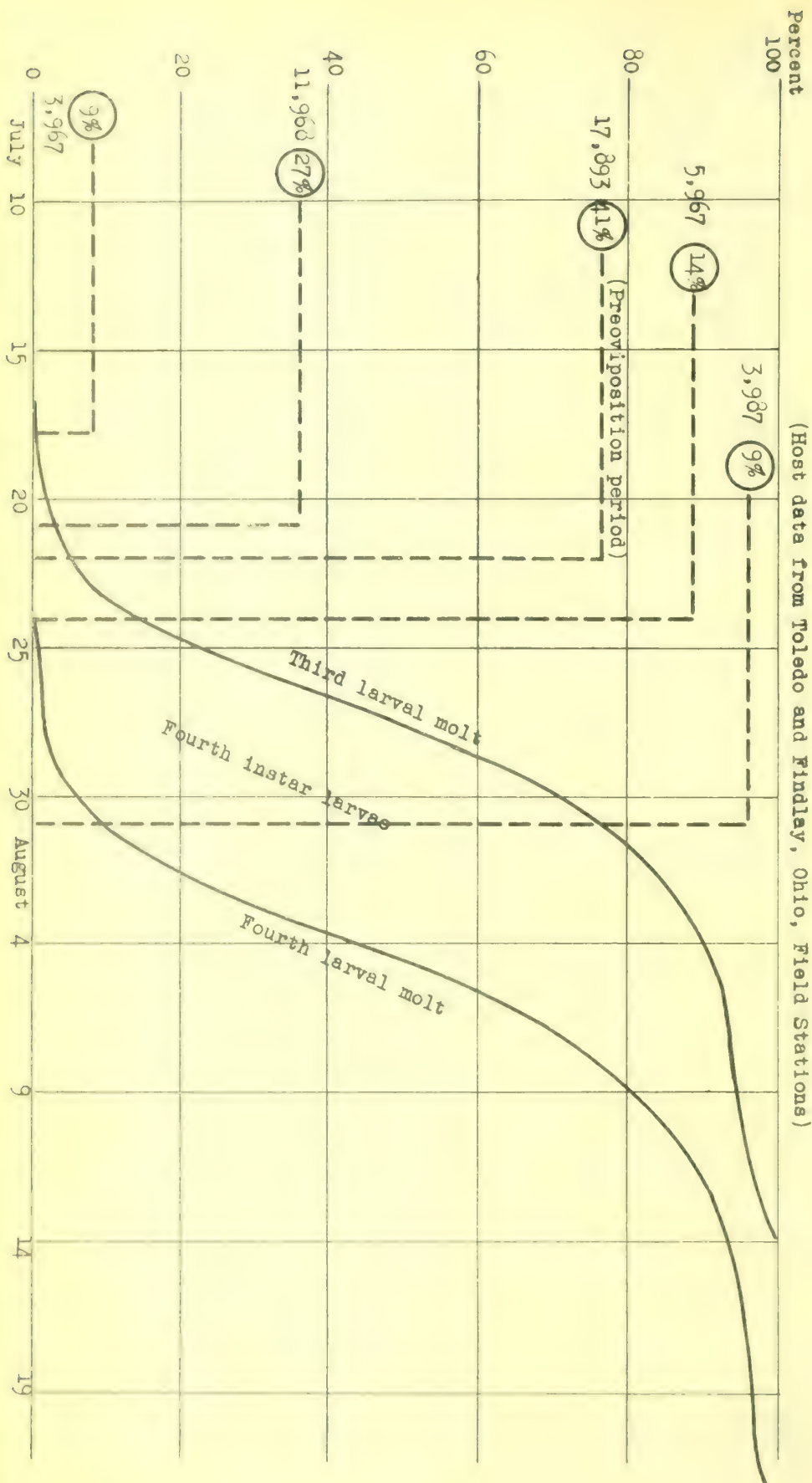


Chart 6

Extent of synchronization of *Lydella stabulans* var *griseescens* releases  
with presence of preferred host stage. Middle West releases.

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.





Extent of synchronization of Lydella stabulana var grisescens releases in Maine, New Hampshire, Vermont, and Massachusetts, with presence of preferred host stage

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

(Host data from Melrose, Mass., Field Station)

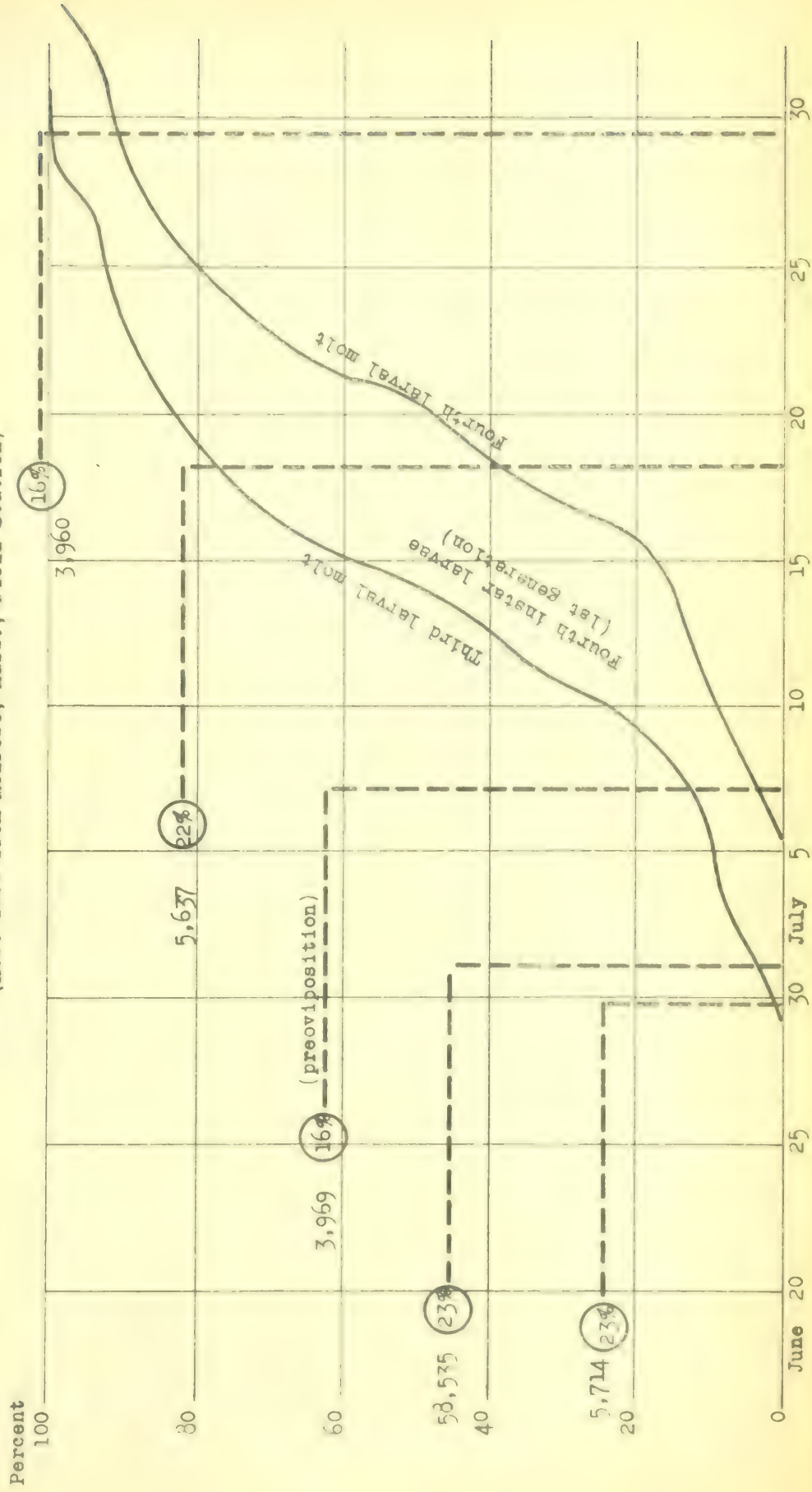


Chart 3

Extent of synchronization of Lydella stabulans var griseescens releases  
with presence of preferred host stage

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

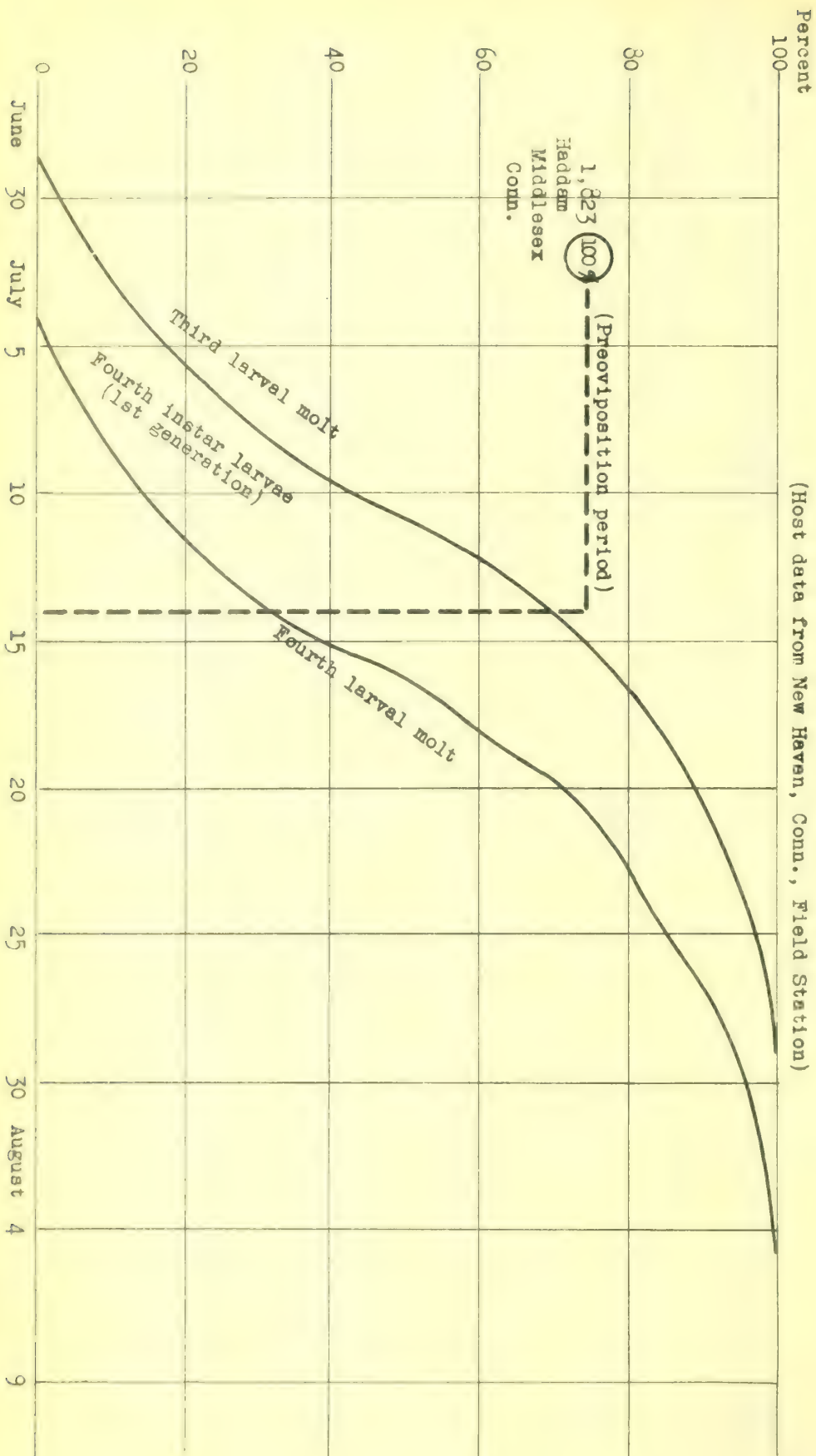


Chart 9

Extent of synchronization of Lydella stabulans var griseescens releases in New Jersey, exclusive of Woodland, Burlington, with presence of preferred host stages

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.

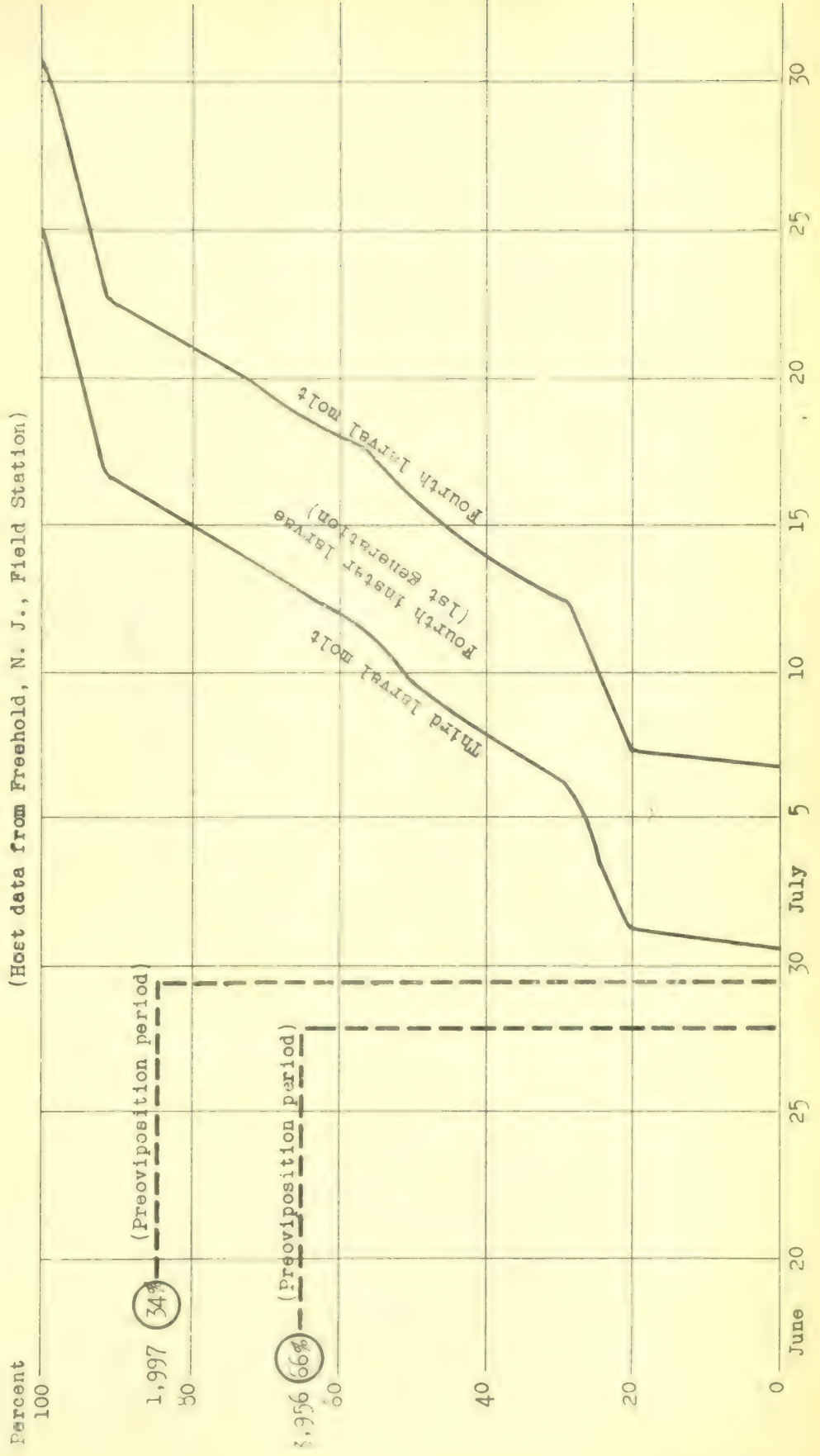
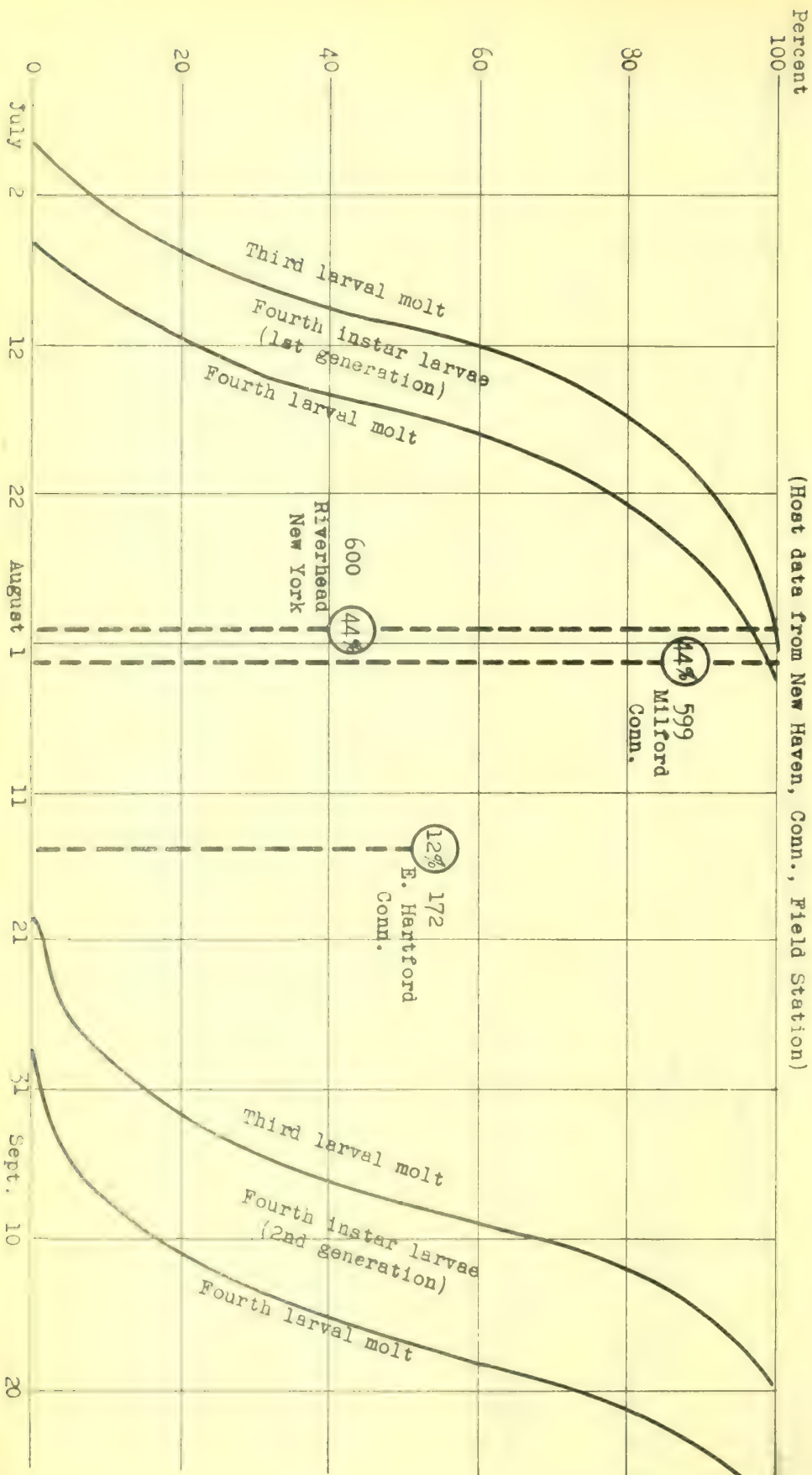




Chart 10

Extent of synchronization of *Gremastus flavoorbitalis* releases  
with presence of preferred host stage

The percent of the total parasites released is indicated in the circles, the horizontal position of which indicates the date of release. Their vertical position has no significance. The number outside of the circle is the number of parasites released.



of this species in the United States. This species was previously colonized in Lucas and Henry Counties, Ohio, and releases were made in 1935 in Hartford and New Haven Counties, Conn., Suffolk County, N. Y., Monmouth County, N. J., and Accomac County, Va.

Table 5.--Releases of *Cremastus flavoorbitalis* in 1935

State	Township	County	Parasites liberated	Period of release (Dates inclusive)
			Number	
Connecticut---	E. Hartford	Hartford	172	August 14
	Milford	New Haven	599	August 1
Total----	--	--	771	August 1 - 14
New Jersey----	Atlantic	Monmouth	593	August 5
Total----	--	--	593	Do.
New York-----	Riverhead	Suffolk	600	July 30
Total----	--	--	600	Do.
Virginia-----	Lee	Accomac	600	July 26
Total----	--	--	600	Do.
Grand total--	--	--	2,564	July 26 - August 14

It was anticipated that practically all adults of *C. flavoorbitalis*, estimated to become available for colonization, would be forwarded to Belleville, Ontario, for release in Canada. Therefore, emergence was planned to synchronize with the development of the one-generation strain. However, emergence greatly exceeded expectation, permitting a number of releases to be made in the more southern districts of the infested area in the United States. While optimum synchronization was not accomplished, it is hoped that sufficient contact was made to furnish an estimate of the possibilities of this species in the respective environments. Chart 10 shows this synchronization.

#### Miscellaneous species:

Seven adults of the oriental braconid *Bracon atricornis* Smith were released on August 14 at the test point in East Hartford Township, Hartford County, Conn.

#### Conclusions:

The season of 1935, in general, is considered to have been much more favorable for the colonization of parasites than that of 1934, because of less prolonged periods of dry, hot weather. The maps accompanying this report show that colonies of the tachinid *Lydella stabulans* var. *griseaens*, more or less widely spaced, have been placed over practically the entire area carrying corn borer populations of sufficient density to be considered capable of enabling the parasite to be successfully established.

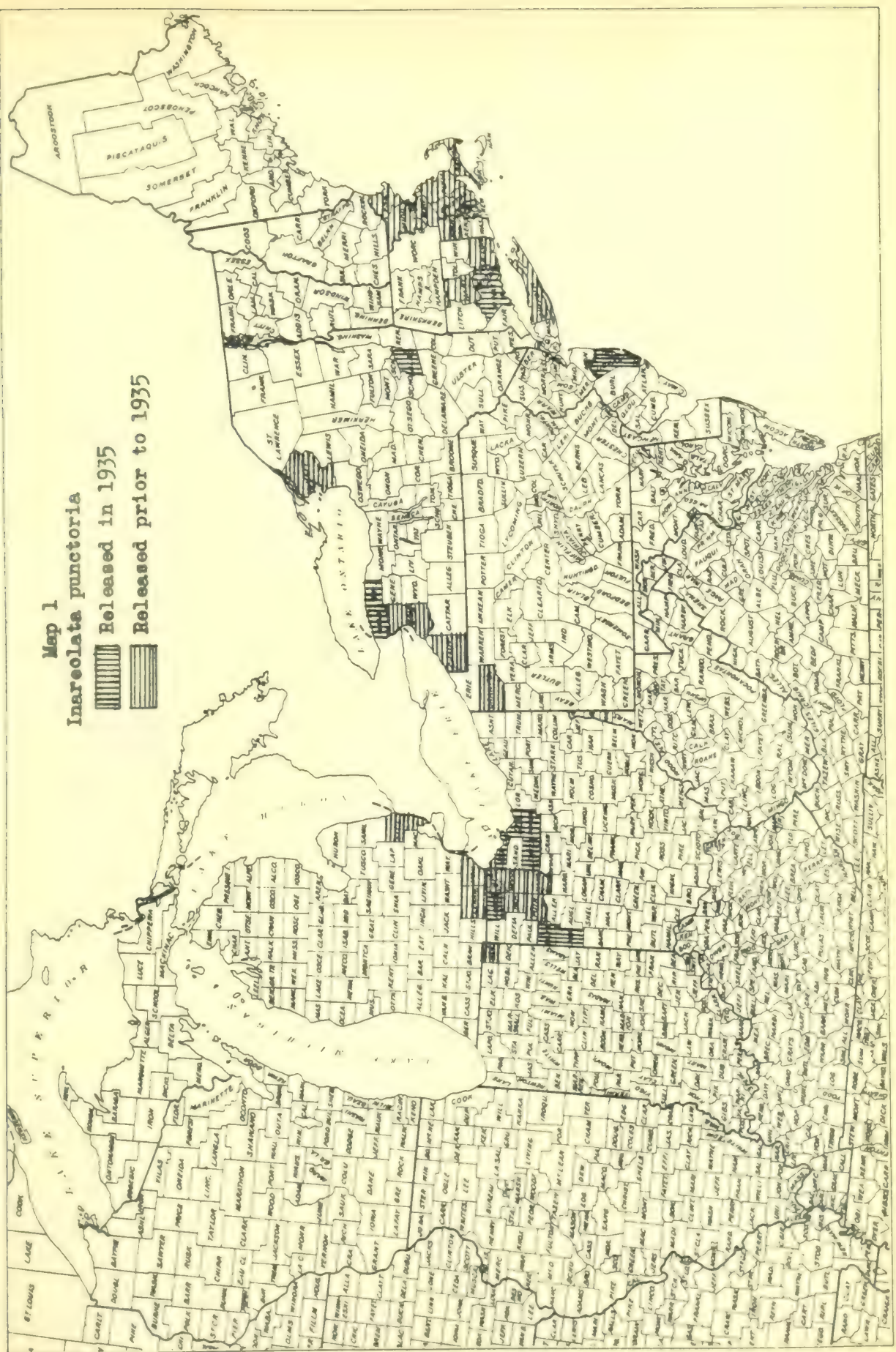
In the case of the ichneumonid *Inareolata punctoria* while considerably less territory has been colonized, with the completion of the current season's releases, these colonies have been extended to the more lightly infested areas.





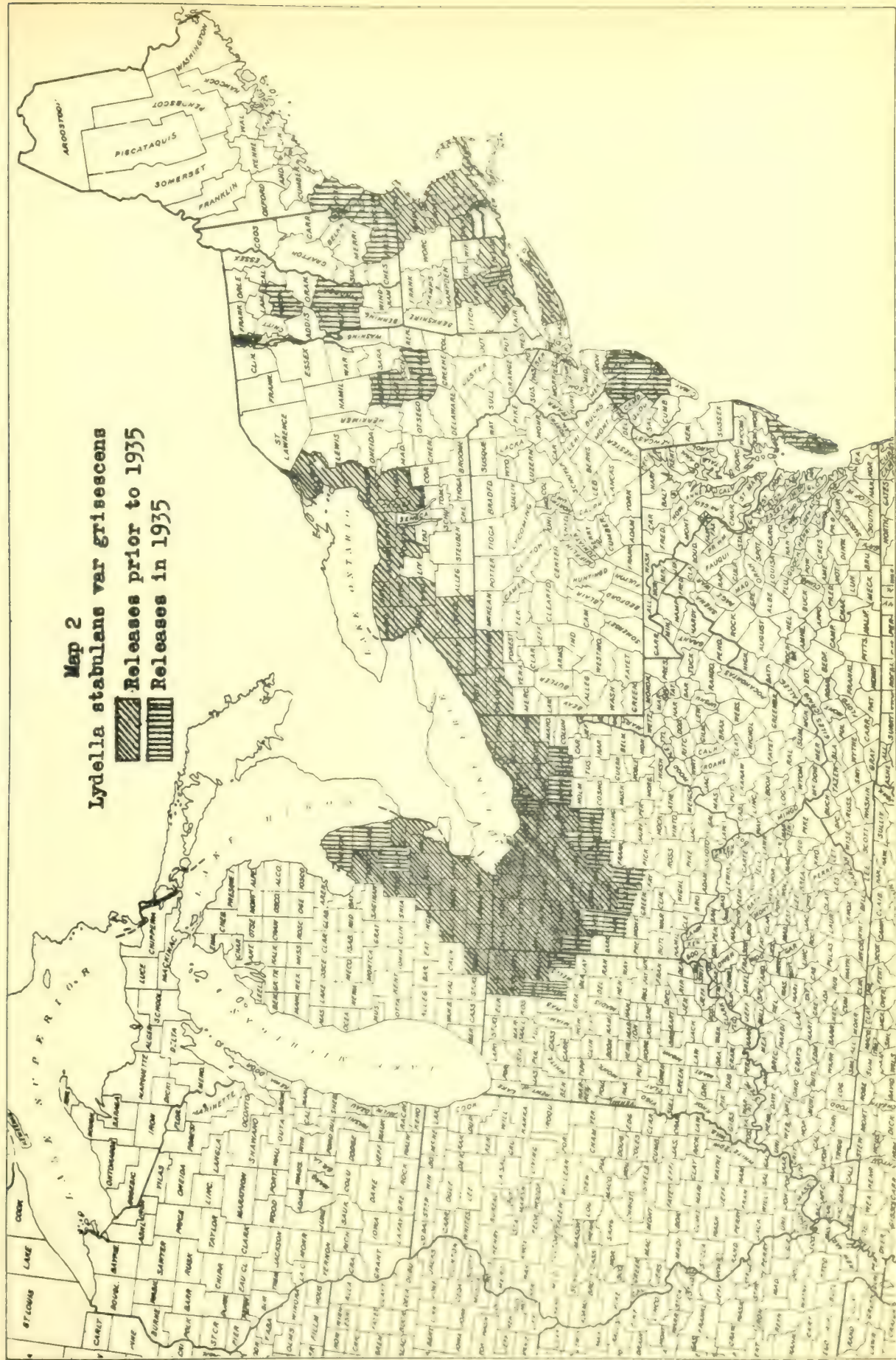
Map 1  
Inareolata punctoria

Released in 1935  
Released prior to 1935













# INSECT PEST SURVEY BULLETIN

Vol. 15

Summary for 1935

No. 10

## INTRODUCTION

The winter of 1934-35 was warmer than normal in nearly all sections of the country, though a narrow belt along the Atlantic coast averaged about normal and a limited area in the Northeast was colder than normal. In general, precipitation for the winter was below normal. A north-south belt extending from North Dakota and eastern Montana to the Rio Grande Valley was dry, some portions having less than half the normal rainfall. The region extending from the far Southwest to the Pacific coast, as well as the West Gulf area, the Northeast, and portions of the Mississippi Valley, received more than the normal amount of rainfall.

April was cooler than normal in the far Northwest and through the central valleys into the Middle Atlantic States. The Northeastern, Southern, and Southwestern States were slightly warmer than normal. May was characterized by subnormal temperatures and excessive rainfall. This condition persisted into June over much of the country. June was abnormally dry in the Southeast and in most sections west of the Great Plains. July had extremely high temperatures, and rainfall was from ample to heavy in most sections east of the Mississippi River, but scanty and markedly deficient in many areas to the west. August was warm and rather dry.

Although temperatures for the fall season averaged remarkably near normal over practically the entire country, there were some unusual occurrences. About the middle of September frost was reported in the Northeast and in the Lake States region. During the first week in October freezing weather and killing frosts extended considerably farther south than usual by this date, and in some districts in the Southeast the temperatures were the lowest ever recorded for this time of year. In southeastern Iowa the most severe freeze for the date in 65 years occurred. The outstanding condition that affected insect abundance was the persistent cool, wet weather in the spring, which provided ideal conditions for the activity of such insects as cutworms and seed corn maggot, and, more important still, prevented one of the worst chinch bug outbreaks in 50 years.

## INSECT PESTS

### GRASSHOPPER ABUNDANCE

Grasshoppers hatched in about the numbers predicted by the 1934 fall egg survey, except in a few counties. Weather conditions during and following the hatching season killed many young hoppers. This was particularly true in the Upper Peninsula of Michigan, and in northern Wisconsin, western Minnesota, and eastern North Dakota, in all of which areas heavy infestations had been predicted. Heavy rains occurred while hatching was in progress and periods of heavy hatching were followed by frequent rains, high humidity, cloudiness, and low temperature, conditions unfavorable to first-instar grasshoppers. In all of these areas great numbers of young hoppers were actually seen in many localities at hatching time but had about disappeared when the fields were visited several weeks later. Vigorous and succulent growth of native vegetation and crops, combined with unusually late hatching, prevented early damage to crops and tended to obscure the dangerous numbers of grasshoppers surviving in areas where weather conditions had been favorable. Considerable damage to late-maturing crops occurred in western North Dakota, western South Dakota, south-central Montana, northern Wyoming, and western Iowa. Injury to range grass was serious throughout the Rocky Mountain region, being particularly severe in Montana, where the loss was estimated at \$500,000. The marked decrease in severity of the 1935 outbreak, as compared with that of 1934, can be judged from the following table which shows the quantity of bait used in the various States during the 2 years.

State	: Bait used in ::		State	: Bait used in ::	
	: 1934	1935 :		: 1934	1935 :
	: Tons	: Tons :		: Tons	: Tons
Arizona.....	: 355	: 122 :	Minnesota.....	: 4,500	: 391
California.....	: 453	: 326 :	Montana.....	: 16,755	: 2,000
Colorado.....	: 1,636	: 733 :	Nevada.....	: 178	: 150
Idaho.....	: 339	: 13 :	North Dakota.....	: 23,667	: 980
Iowa.....	: 200	: 600 :	South Dakota.....	: 7,522	: 500
Kansas.....	: 537	: 260 :	Wisconsin.....	: 5,096	: 150
Michigan.....	: 1,195	: 900 :	Wyoming.....	: 5,250	: 785
Total.....	: - -	: - - :		: 67,683	: 7,910
	: :	: :		: :	: :

(J. R. Parker, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

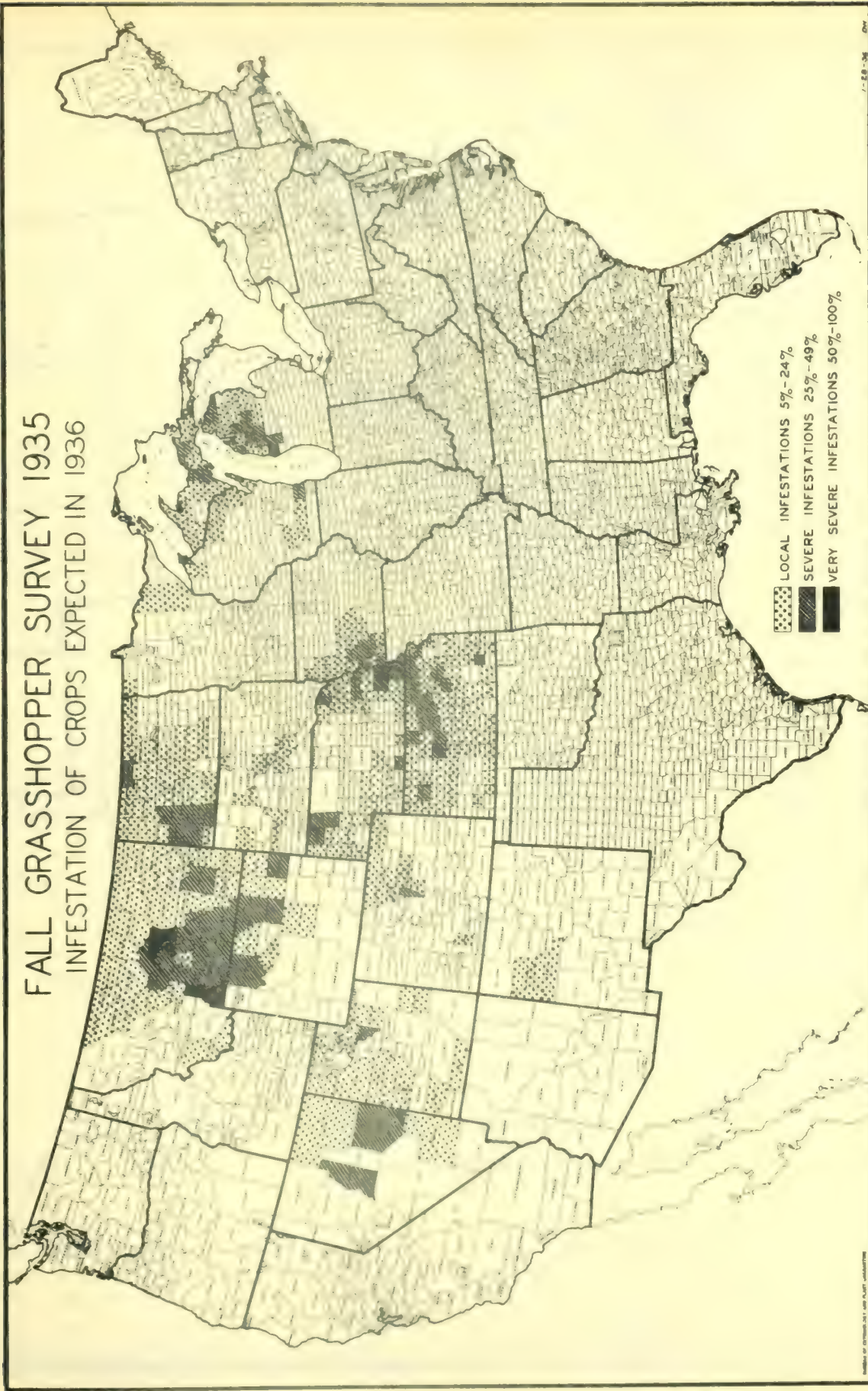
### GRASSHOPPER SURVEY

The results of the fall grasshopper survey for 1935 (see map) are given by showing the number of counties in each State having an average infestation rated as very severe (50 to 100 percent), severe (25 to 49 percent), and local (5 to 24 percent). Very severe infestations were found in 2 counties in Michigan, 2 in Montana, and 2 in Nebraska. Severe infestations were found in 17 counties in Kansas, 12 in Michigan, 12 in Nebraska, 10 in Montana, 8 in North Dakota, 6 in Iowa, 3 in Wyoming, 2 in Wisconsin, 2 in Nevada, 1 in Colorado, and 1 in Utah. Infestations were more or less local in South Dakota, Minnesota, and New Mexico, and were local in Idaho and California.



# FALL GRASSHOPPER SURVEY 1935

## INFESTATION OF CROPS EXPECTED IN 1936



COUNTY OUTLINE MAP OF THE UNITED STATES



MORMON CRICKET

Infestation as shown by egg survey  
in the fall of 1935

UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE



Populations in all areas were greatly reduced from those of the 1934 survey, except in western Iowa, eastern Nebraska, eastern Kansas, southern Wisconsin, and the northern half of the Lower Peninsula of Michigan. In these areas light or local infestations have developed into severe or very severe ones. Heavy rains and cloudy weather during the hatching period greatly reduced the infestations of Carmula pellucida Scudd. and other species in northern Minnesota, northern Wisconsin, and the Upper Peninsula of Michigan. Melanoplus mexicanus Sauss. was the dominant species over most of the area. C. pellucida was greatly reduced in numbers by unfavorable weather. M. differentialis Thos. is building up again along the river courses of South Dakota, western Iowa, Nebraska, and Kansas. M. bivittatus Say is also increasing in these places, where succulent food was plentiful last summer, and is again becoming abundant in counties fringing the mountains in Colorado, Wyoming, and Montana. M. differentialis and M. bivittatus Say had become scarce under the severe drought of the past several years. M. femur-rubrum DeG. was numerous in alfalfa fields and grasslands in the more humid regions. M. packardii Scudd. was an important species in the Dakotas and Mountain States. Certain so-called prairie forms, as Aulocara ellioti Thomas, Ageneotettix deorum Scudd., and Drepanopterna femoratum Scudd., were also abundant, causing much damage to grazing lands and cultivated crops adjoining in the stock-raising areas. (R. L. Shotwell, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### MORMON CRICKET AND COULEE CRICKET

An unprecedented outbreak of the mormon cricket is in progress in some of the Western States. During the year eight States--Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Washington, and Oregon--reported outbreaks of varying intensity and extent, and all of these States except Utah and Oregon carried on control campaigns. From extensive egg surveys made this fall, severe infestation may be anticipated next year. The accompanying map showing the general location of infestations was prepared from the egg-survey data. The following acreage was found to be infested: Colorado, 308,300; Idaho, 1,815,104; Montana, 1,249,570; Nevada, 984,999; Oregon, 23,000; Utah, 109,840; Washington, 199,730; Wyoming, 1,141,159; total, 5,831,752. The most threatening infestations are in Montana, Idaho, Nevada, and Wyoming, situated in or near the agricultural sections. The area of infestation in Washington is relatively small but is located in valuable agricultural land.

The coulee cricket developed into outbreak numbers in an area of 4,100 acres lying east of Cashmere and bordering the Wenatchee Valley in Chelan County, Wash. Considerable agricultural land is threatened. (F. T. Cowan, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### CHINCH BUG

The great numbers of chinch bugs in hibernation at the beginning of the year presaged the most severe and widespread outbreak in 50 years. They were known to be abundant from central Oklahoma to eastern Ohio, with the greatest density of population in Missouri, southern Iowa, and central and northern Illinois. In the most heavily infested region thousands of bugs were often present in a single clump of bunch grass, the maximum reported being about 60,000. The only area where winter mortality of



consequence is known to have occurred was southern Iowa. In that area a thick ice sheet, persisting for several days, was reported to have caused a mortality ranging from 50 percent to 90 percent in localities where there was no protective layer of snow under the ice. A cold, wet spring largely prevented the incipient outbreak. More or less continuous rains up to the latter part of June interfered with migration from winter quarters and caused the death of great numbers of newly hatched first-brood bugs in small grains by drowning them or plastering them with mud. Except in a few localities, fungous diseases were only a minor factor in reducing the outbreak. Serious injury to small grains occurred in southeastern Iowa and north-eastern Illinois. Migrations from small grains to corn at harvest time was also quite general and severe in these areas and occurred to a more limited extent in scattered localities of central Illinois, Indiana, and Ohio. Over most of the infested area, however, these migrations were not of sufficient magnitude to warrant the construction of barriers. Many of the bugs completed their growth in the small grains or in the ample growth of foxtail in the grain stubble and migrated to corn by flight rather than on foot. Conditions during the summer were fairly favorable to development of the second brood on corn and on foxtail growing in the corn in Missouri, Iowa, Illinois, and Indiana, and on the sorghums in central and eastern Oklahoma and eastern Kansas. By fall, therefore, from moderate to abundant numbers of bugs were going into hibernation in the Central States. Surveys in November and December indicated moderately dangerous numbers of bugs hibernating in central and eastern Oklahoma, southeastern Kansas, central and northern Missouri, northern Illinois, and parts of Indiana and Ohio, with extremely large numbers again present in southeastern Iowa and west-central Illinois. (C. M. Packard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### HESSIAN FLY

A striking instance of the rapidity with which the hessian fly can increase in two successive favorable seasons was seen in the fall of 1934 and spring of 1935. It greatly increased in abundance throughout much of the winter-wheat belt in the interval between the 1934 and 1935 harvests. Injury to this year's crop occurred in varying degree from southeastern Kansas to central Pennsylvania, with the maximum in northern Indiana, where a field survey at harvest time indicated 50 percent or more of the wheat stems infested. (For a complete report see Insect Pest Survey Bull., Vol. 15, no. 6, Sum.) Notwithstanding the fact that most of the wheat was sown after the normally safe dates in the fall of 1935, weather conditions have continued to favor fly activity to the extent that this insect has been able to reproduce abundantly over rather large areas. Such reports as are available early in December indicate that the fly has been able to maintain itself in from moderate to abundant numbers from north-central Oklahoma through southeastern Kansas, Missouri, southern Iowa, southern Illinois, and much of Indiana, grading into very light infestations in Ohio with somewhat larger numbers indicated in western and central Pennsylvania and New York. The particular conditions allowing fly development in the fall were sufficient rains late in August and early in September to bring up the volunteer wheat and cause an emergence of flies from the stubble to infest it. Additional rains the last of September and first of October induced pupation among the new brood of flies maturing in volunteer wheat and further pupation in stubble, which culminated in an unusual emergence of adults the middle of October. Much wheat sown after the normally safe dates received infestation from these adults, the progeny of which appeared to be maturing

successfully in the periods of mild weather late in the fall and in the early winter. Counts made during December in 24 fields in western Indiana showed an average of 40 percent of the plants infested. The stand in some fields may be materially reduced by this unusual infestation in the comparatively small, late-sown wheat, and there is likelihood of serious injury to the current crop where weather conditions next spring favor the development of the spring brood. (C. M. Packard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### EUROPEAN CORN BORER

A complete report on this insect was prepared by A. M. Vance, of the Bureau of Entomology and Plant Quarantine, and was published as a supplement to no. 9, vol. 15, Insect Pest Survey Bulletin.

#### ALFALFA WEEVIL

At the beginning of the season in 1935 adult alfalfa weevils were present in destructive abundance at Tremonton, Salina, and Salt Lake, Utah; Medford, Oreg.; Reno, Nev.; Grand Junction, Colo.; and Harrison, Nebr. In none of these places was the population of weevils excessive, and the weather, being nearly normal after a series of widely erratic seasons, gave rise for the most part to a normal population of larvae on the first crop. The resulting damage was general but not excessive. The temperatures at Salina, and Grand Junction were somewhat lower than indicated above, and this condition was reflected in delayed oviposition, which at Salina reduced the expected damage to the first crop. The same condition at Grand Junction failed to benefit the first crop because spring frosts delayed the cutting until the larvae had reached and passed their stage of maximum destructiveness. A single field at Harrison, Nebr., was seriously damaged, chiefly because, through lack of experience with the weevil, the crop was allowed to stand until the maximum injury developed. A survey of the weevil-infested territory in autumn showed a prevalence of from moderate to low populations in most localities. The weevil was taken in Clark County, Nev., in April, which established a new infestation record. In the course of scouting operations in June new infestations were found in the following places: Scotts Bluff County, Nebr., Montezuma County, Colo., Kane County, Utah, and Coconino County, Ariz. (Geo. I. Reeves, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### CUTWORMS

As a result of cool, rainy weather, cutworm injury occurred abundantly over the United States east of the 100th meridian and in isolated localities in California, Arizona, Utah, and southwestern Idaho. The army cutworm was the first species to attract attention. It was observed in Hayes County, Nebr., and Riley County, Kans., in the latter half of February. As the season advanced it became destructively abundant over most of Kansas, southern Nebraska, and in scattering localities in Oklahoma. The variegated cutworm was found in association with the army cutworm and extended its depredations over much more territory, including Arkansas, Missouri, Iowa, Minnesota, and Michigan. It was also reported from the Sacramento Valley and southern California. Various species of climbing



cutworms were reported as injuring fruit buds in isolated localities in many parts of the country.

#### ARMYWORM

The first report of damage by the armyworm was received from southwestern Missouri in March, and by the last of April swarms of moths were observed over most of the State. In May heavy flights occurred over Illinois and Indiana. In June, outbreaks of larvae were occurring over the States mentioned, extending into western and central Kentucky, through Iowa into southern Minnesota, into southeastern Nebraska, through eastern Kansas, and into northeastern Oklahoma, where severe damage was caused. Reports of isolated damage were received from Baltimore County, Md., and Norfolk and Wm. Counties, Va. As is usual in an outbreak of this insect, parasites and predators became abundant and gained control by the end of the season.

#### VETCH BRUCHID

The vetch bruchid, which was first recorded in the United States in 1931, has spread considerably in North Carolina. A survey in the west-central part of the State showed 15 counties infested. Smooth and hairy vetch are attacked and in Rowan County, the original infested area in that State, the infestation averaged 50 percent of the pods. New records of infestation include Washington County, Md., a locality in Franklin County, Pa., a county already infested, and Chesterfield and Lancaster Counties, S. C.

#### FRUIT APHIDS

The three most important species of apple aphids hatched in about normal abundance during the latter half of March and the first week in April in the northeastern fourth of the United States. Development was retarded by unfavorable weather conditions and only moderately heavy infestations were reported. An unusually heavy infestation of the rosy apple aphid was reported from northwestern Arkansas the last of May. On the whole, aphid injury was less than usual and no extensive commercial damage was reported. A report from Virginia, dated October 28, stated that fall migrants and oviparous females of the rosy apple aphid were unusually abundant throughout the apple-growing district.

#### CODLING MOTH

Injury by the codling moth was lighter over the country as a whole than it has been since 1929. Reports from California indicated that apples, pears, and peaches in the Sacramento Valley suffered greater injury than in 1934. The cool, rainy weather during May, which delayed emergence, and the low evening temperatures, which prevented maximum egg-laying, were probably the controlling influences in the low infestation. Many of the first-brood larvae lacked sufficient vitality to enter the fruit. In July the second-brood larvae were reported from scattered localities as increasing in abundance, but they were effectively controlled. Unusually warm weather during the first half of September stimulated activity in some of the East Central States and in the Yakima and Wenatchee Valleys in Washington. Reports from over the country generally indicate that there were comparatively few larvae to enter hibernation this fall.



## ORIENTAL FRUIT MOTH

Twig and fruit injury by the oriental fruit moth was reported as light over most of the infested territory. A report from Illinois on July 24 stated that large numbers of larvae were entering peaches. In Ohio, although early peaches escaped injury and later varieties suffered little injury, quinces were severely damaged. The insect was discovered in the northwestern corner of Missouri in 1935, the first record for that part of the State. It had been present across the State line in Kansas since 1932. Our first report of its presence in New Hampshire was received in September.

## EASTERN TENT CATERPILLAR

A very severe outbreak of the eastern tent caterpillar occurred this year. The infestation was centered in the New England States, southeastern New York, and New Jersey, and extended into northwestern New York, Pennsylvania, northeastern Ohio, through West Virginia, eastern Kentucky, and into Tennessee and Georgia. As early as March 20 tents were being observed in Tennessee, and on March 25 the heaviest infestation on record was reported from the Fort Valley district in Georgia. The great abundance of overwintered egg masses started to hatch the last week of March in the latitude of Washington, D. C., and by the last week of April, they had been progressively reported as hatching all the way northward to Vermont and New Hampshire. Within the next 2 months complete defoliation was reported from much of the infested area and the insect had taken a place as one of the outstanding tree insects of the season.

## FRUIT FLIES

Glass fly traps, baited with a solution of brown sugar and water, have proved their value in locating infestations of Anastrepha ludens Loew in the Rio Grande Valley. Through the use of these traps, adults were taken on 166 premises and brush locations in 1934-35. The total number of flies trapped in the valley area was approximately 20 percent greater than the number trapped in 1933-34, but the number of premises known to be infested with adults decreased 5.7 percent. Larval infestations were located in grapefruit on 27 properties in the lower part of the valley. As in the case of an adult infestation, the trees on all properties where larvae were found were promptly sprayed and the fruit was buried, processed, or limited as to use. On account of finding infestations near Falfurrias in March, 1935, the regulated area was enlarged to include Brooks County, Tex. Besides A. ludens, 8 other species of fruit flies have been taken in traps in the Rio Grande Valley, but there has been no record of their attacking any fruit of economic importance. The local host of only one of these flies is known. A. pallens Coq. has been found to feed only in the seeds of Bumelia angustifolia. The papaya fruit fly (Toxotrypana curvicauda Gerst.) has been captured, but this species is of no economic importance under valley conditions. The other 6 species taken in the traps have not been found infesting fruit and comparatively little is known of their habits. Included among these finds were A. serpentina Wied., A. fraterculus Auct., and A. striata Schin. (R. S. Hoidale, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## PLUM CURCULIO

Reports on the plum curculio in the Southeastern States early in the season indicated that serious injury might be anticipated. In the Georgia peach belt a greater number of beetles went into hibernation in 1934 than usual and in the spring of 1935 they began leaving earlier than usual. This resulted in a heavy larval infestation, and there was every indication of a heavy second brood and serious injury to the ripening peaches, but dry, hot weather, just at the time the beetles should have begun to oviposit, brought about an important change in development by preventing oviposition. Very few eggs were laid, and the peach crop was harvested without much injury. It is a significant feature that the beetles went into hibernation this fall without laying eggs and will have a superabundance for deposition next spring. Damage by the insect was negligible throughout the northern part of its range.

## CHERRY FRUIT WORM

The cherry fruit worm (Grapholitha packardii Zell.) was found to be quite common in sour cherries near Kent, Wash., in July. It was later determined that the insect occurs throughout the district between Seattle and Tacoma. It has caused considerable damage to cherries in British Columbia, especially on Vancouver Island.

## CHERRY SCALE

A well-established infestation of the cherry scale was found on pears near Sacramento, Calif., in July 1934. This scale is common on deciduous fruit and ornamental trees east of the Rocky Mountains, but this is the first record west of the mountains.

## SEED CORN MAGGOT

The cool, rainy weather during the early part of the growing season delayed germination of seeds and was very conducive to the activity of the seed corn maggot. Reports of serious injury to the usual hosts were received from western New York through Michigan and Indiana to North and South Dakota and Nebraska, as well as from Colorado, Utah, Idaho, and southern California.

## SWEETPOTATO WEEVIL

Two new infestations of the sweetpotato weevil were discovered during the year, one in Pike County, Miss., and one in Decatur County, Ga. The insect was also reported as occurring in great abundance in Gadsden County, Fla. Careful scouting in Greene County, Miss., failed to reveal the pest where it was found on 12 farms in 1934.

## PEPPER WEEVIL

Adults of the pepper weevil remained active all winter in Orange County Calif., and an early infestation was built up in some fields; however, development was retarded and no appreciable damage occurred until August, when very warm weather provided ideal conditions for reproduction. At that time





UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE



from 25 to 50 percent of the crop was threatened. The most significant feature of the season was the discovery of this weevil in Manatee County, Fla., in May. Scouting revealed the presence of the insect in nearly every pepper field in the county, but none in the adjoining counties. An eradication campaign was inaugurated and all of the pepper plants and wild host plants in the infested area were destroyed. In the collections of the National Museum there are specimens labeled "Mansura, La., June 29, 1904."

#### MEXICAN BEAN BEETLE

Reports on the survival of the Mexican bean beetle in cages at Columbus, Ohio, at Newark, Del., and in the Estancia Valley, N. Mex., showed that the winter mortality was higher than usual. The beetle overcame this early handicap, and by the middle of July it had built up heavy populations over most of its range east of the Mississippi River. By the end of the season it had caused the most serious injury in several years. It extended its range of destructive abundance and several points of new infestation were discovered. The accompanying map shows the spread since 1932.

#### BEET LEAFHOPPER

The curly-top disease caused by the beet leafhopper was not so serious as in 1934. Cool, wet weather in the spring retarded development of the leafhopper in the San Joaquin Valley and little damage was done. The insect became normally abundant in Idaho and Utah and injured beets, tomatoes, and beans. Weather favorable to the growth of sugar beets prevailed in July and some of the curly-top injury to the crop was overcome.

#### INTRODUCED WEEVIL

A recently introduced weevil, Calonycterus setarius Roelofs, attracted considerable attention during the summer in isolated heavy infestations in Cumberland County, Pa., Baltimore County, Md., and Litchfield and Fairfield Counties, Conn. A great variety of host plants were attacked. The weevil was first discovered in this country in 1929 in Westchester County, N. Y., and in 1932 it was found to be established in Litchfield County, Conn.

#### BOLL WEEVIL

Damage by the boll weevil was comparatively light during 1935. Throughout the States where the weevil occurs the infestations varied greatly, even in limited areas. These variations in abundance were due to such factors as local differences in rainfall, proximity to hibernation quarters, and whether or not the cotton leaf worm defoliated the cotton in the fall of 1934. In some counties during midsummer the infestations ranged from less than 5 percent punctured squares in some fields to more than 90 percent in others. Although in all sections the weevils were largely held in check by natural conditions, this was especially true in the southern and northern thirds of the Cotton Belt. In the region within 200 miles of the Gulf coast in the States east of Texas the population was never heavy, except in limited areas. This favorable condition that prevailed in the Gulf coast region was due partly to a light spring population, because few weevils entered hibernation



in 1934. The growers in most places also received the benefit of sufficient hot, dry weather during the summer to hold down the weevil population and allow the production of satisfactory crops of cotton. In the northern third of the Cotton Belt the weevils were greatly reduced by the low temperatures of the winter of 1934-35 and were again checked by the hot, dry weather of the summer. During the spring and early summer conditions were favorable for the weevils over a large portion of the central third of the Cotton Belt, from the Atlantic coast westward into Texas. Many growers in this area, especially in the Delta sections of Arkansas, Louisiana, and Mississippi, made preparations for a hard fight against the weevil and some of them began dusting in June, but hot, dry weather in July and August satisfactorily checked the weevils in many fields. It was, however, in this central belt that most of the poisoning for boll weevil control was done and most of the serious damage occurred. Late in the fall, as the weevils entered hibernation, they were reported to be more abundant than usual in the vicinity of Florence, S. C., and College Station and Port Lavaca, Tex., while the opposite condition was reported from Mississippi, Louisiana, and Oklahoma. The defoliation of the cotton plants by the leaf worms over such a wide range has undoubtedly greatly reduced the number of weevils entering hibernation this fall. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### THURBERIA WEEVIL

The Thurberia weevil was first discovered in the United States in the latter part of 1912 in mountains near Tucson, Pima County, Ariz. This insect was found on the Thurberia plant, which is related to cotton. At that time there were no commercial plantings of cotton in that section, but by 1918 such plantings were begun, and later they were extended along the Santa Cruz Valley, in Santa Cruz and Pima Counties, and in certain sections of Cochise County. The weevil was first found in cultivated cotton in 1920, and has been found in nearly every crop since then. A few weevils were also found in the southern part of Pinal County in 1931, but none has been found there since. For the past several years practically all of the cotton acreage involved has been in Pima County. This year, by means of gin-trash inspection, 15 weevils have been found. The eradication of Thurberia plants, many of which are infested, is now being undertaken in the mountain ranges near fields of cultivated cotton. (R. E. McDonald, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### PINK BOLLWORM

Gin-trash inspection of the 1935 cotton crop is just about completed, and no specimens have been found in any new areas this year. No specimens were found in the regulated areas in Florida and Georgia, nor in the Plains counties of Texas, known as the "Western Extension." A very light infestation continues to be present in El Paso, Pecos, and Ward Counties, Tex., in Dona Ana, Chaves, and Eddy Counties, N. Mex., and in Graham County, Ariz. A small amount of cotton is grown in Greenlee County, Ariz., but ginned in Graham County, and it is possible that some of the specimens found in Graham County originated in Greenlee County. In the above areas under regulation the infestation is very light, and no commercial damage is being done. In Brewster, Iresidio, and part of Hudspeth County, Tex., a considerable number of worms is present but, because of special control measures which have been



carried on for a number of years, there was practically no commercial damage in 1934 and 1935. The eradication of wild cotton in southern Florida is just now (December) getting under way for this season. Most of the wild cotton known to be infested was destroyed during the two previous seasons. (R. E. McDonald, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### BOLE WORM OR CORN EAR WORM

The boll worm was observed breeding throughout the entire winter of 1934-35 on corn and other host plants in the vicinity of Brownsville, Tex., in the lower Rio Grande Valley. As a cotton pest this insect was more serious in 1935 than during any year since 1929. This was especially true in northern and eastern Texas. The emergence in hibernation cages at College Station, Tex., in the spring of 1935 was 5.53 percent. The first egg was found there on March 22 and one first-instar larva was recorded on March 29, both instances being on alfalfa. The first moth was found in corn on April 5 and at that time eggs were present at the rate of 11 per 100 plants. There was a slight increase in eggs the following week, but during the season the eggs were not as abundant on corn plants or silks as they usually are; however, enough worms developed to cause at least 90 percent of the ears to be injured by the last of June. On cotton the average number of eggs ranged from less than 5 during the early part of July to 105 per 100 cotton terminals on August 10, the peak of the season. Three broods occurred on cotton, but only those in July and August caused serious damage. The September brood was not important. The past season was the first time that general poisoning was resorted to for boll worm control. Comparatively good yields were made in fields where poisoning was done, but little fruit was set during the time the first and second broods on cotton were active in July and August. Fortunately, late frosts permitted the top crop of cotton to develop to maturity in that section of Texas. At Florence, S. C., the insect caused little damage and was not as abundant in cotton fields as in 1934, when some damage was noted. In the hill section of Mississippi there was an unusually large number of eggs and larvae on cotton from June 20 to July 5, but for some reason practically no damage was caused in 1935. In the Delta sections of Mississippi and Louisiana the boll worm was present in about the usual small numbers on cotton and no particular damage was noticed. At Presidio in the Big Bend area of Texas boll worms were much more numerous than for several years. They were most abundant during June and July and, although they caused some damage to cotton, much greater damage was done to corn. In Oklahoma boll worm injury was light, except in some rank cotton in the eastern part of the State. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Note. -- As a pest of corn this insect was remarkably scarce generally over the eastern half of the United States. In Idaho and Utah the insect was reported as causing more damage than usual. A serious outbreak occurred on tomato in the Yakima Valley of Washington. In some plantings from 75 to 80 percent of the fruit was infested. In the San Francisco Bay district and in southern California damage ranged from 5 to 25 percent.

## COTTON LEAF WORM

The cotton leaf worm appeared in all of the cotton-growing States earlier than usual. It was particularly abundant in parts of Texas, Oklahoma, Arkansas, Louisiana, and Mississippi. Hundreds of thousands of acres of cotton were treated in those States during August and September. At Florence, S. C., although leaf worms appeared 2 weeks earlier than in 1934, they caused less damage and did not completely defoliate a single field in that vicinity. In the hill section of Mississippi, in the southern part of the State, the insect appeared only 10 days earlier, but completely defoliated the cotton plants 30 days earlier than in 1934. During the last 10 days of August all fields in the southern part of the State were stripped, whereas in 1934 it was late in September before this happened. As the crop was extremely early and was mature before the leaf worms appeared, no damage was done to the crop. In the northern third of the State the insect was abundant after August 15 and caused damage where it was not controlled. Owing to the lateness of the crop in this section, it was necessary for many farmers to poison two generations of the worms. In Washington County in the Delta section of Mississippi the first leaf worms were noted on July 11 and by August 3 the farmers were complaining about them. By August 24 the worms were in all fields, by September 7 some fields had been stripped, and by the end of September stripping was general. In Madison Parish, La., leaf worms may have caused some slight injury in a few isolated fields where stripping occurred in August, but in general this came after the cotton was mature and no injury was caused. In the vicinity of College Station, Tex., the first moth was found in cotton the last week of June and the first worms were noted during the first week of July. By July 15 dusting was fairly general and was continued when needed until October, therefore a few cotton fields in that section of Texas were defoliated. The leaf worm appeared in May and June in southern and central Texas and many fields were poisoned in June. In some sections considerable damage was done, owing to the shortage of insecticides. In the Big Bend area of southwestern Texas the infestation was much heavier than during the past few years. Many cotton fields in Virginia were defoliated in September. The moths made their appearance in the Northern States earlier than usual, being reported from Maine and Michigan in August, and large numbers of them appeared in Washington, D. C., in September. They were reported as fairly abundant in October in Illinois, Iowa, and Michigan. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## BEET ARMYWORM

The beet armyworm was unusually abundant on cotton during the spring of 1935 and caused considerable damage to the young plants in all the irrigated sections of the West and in Mexico. Several hundred acres had to be replanted and poor stands were caused on numbers of other fields in the Big Bend area of Texas. Alfalfa was also badly defoliated. This was the first time that this armyworm has occurred in sufficient numbers in this area to cause economic damage to cotton. It was necessary to replant 200 acres of cotton, and other fields were damaged in the Tucson district of Arizona. Serious injury also occurred in the Salt River Valley, especially the western part, and considerable acreage was dusted and irrigated for protection.



Reports of similar damage were received from the El Paso Valley of Texas and the Mesilla Valley of New Mexico. C. S. Rude reported the insect was present throughout the cotton fields of the Laguna district of Mexico in April and early in May, and in many cases the cotton was almost completely defoliated. Although in most cases the cotton recovered, it was considerably later because of the attack. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### APHIDS ON COTTON

The cotton aphid (Aphis gossypii Glov.) occurred as usual wherever cotton was grown. Usually it is the most important aphid attacking cotton, but a survey made during 1935 indicated that A. medicaginis Koch was more serious as a cotton pest and more generally distributed in the Atlantic Coast States. Its attacks are usually confined to the terminal buds and it is seldom seen on the large leaves, except in cases of extremely heavy infestations. A. gossypii was frequently reported as serious in all parts of the Cotton Belt following the use of arsenical poisons but many heavy infestations were observed in fields where no arsenicals had been used. These leaf aphids caused about the same amount of damage in South Carolina in 1935 as during the previous year. In Mississippi no serious aphid infestation was observed in 1935, except on cotton that had been dusted. Heavy infestations developed on many plots where only three applications of calcium arsenate were made during the season. In Louisiana cotton aphids were present in unusually large numbers and caused some injury during the past season, particularly on poisoned cotton. In the vicinity of College Station, Tex., aphids were first observed on cotton in April and by May 18 were fairly abundant in many fields. The infestations began to decrease during the first week of June and remained low until the early part of August, following heavy dusting. The infestations were heavy during the remainder of the season and possibly caused some injury to small bolls, as some failed to develop to normal size and opened prematurely. At Port Lavaca, Tex., the aphids were comparatively scarce on cotton during May and June during the period when infestation usually is most serious. The damage caused by root aphids (Anuraphis maidi-radici Forbes, Trifidaphis phaseoli Pass., and Rhopalosiphum sp.) was far greater in 1935 than in 1934. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### COTTON FLEA HOPPER

Emergence of the cotton flea hopper from overwintered eggs was about normal in southern Texas during the spring of 1935. Although the general infestation in cotton fields was a little later than usual, weather conditions were favorable for its rapid multiplication during the latter part of May and during June. The hopper took a large toll of the early crop of cotton throughout southern Texas and also throughout most of the black-land belt of central Texas. The damage caused by this insect to the early crop and by the leaf worm and boll weevil to the late crop caused a considerable reduction in the final yield in the coastal and black-land sections of Texas. Croton was abundant last fall and, as this is the principal plant in which the cotton flea hopper overwinters in the egg stage, conditions are favorable for a large number of these insects to hibernate successfully in this stage. At College Station, Tex., the total emergence in cages was higher in the spring of 1935 than in any recent year except 1932. Nymphs and adults were observed late in



March and were general in cotton fields by the end of April. By June hoppers could be found in some fields at the rate of 28 per 100 plants and the average remained about that number during June, though it was heavier in some fields. During the latter part of June dusting was done on four plantations in the vicinity of College Station. The hoppers were decreasing rapidly by July 13. In Arkansas and Oklahoma there were some reports of cotton-hopper injury. In Louisiana and Mississippi these insects were also present in the cotton fields, but other mirids, Lygus pratensis L., and Adelphocoris raphidus Say, caused more damage to cotton. The cotton flea hopper occurs in practically all areas where cotton is grown. This year for the first time it was recorded definitely as a cotton pest of importance in Arizona, although another mirid, Lygus elisus hesperius Knight, was more abundant and caused more damage in that State. (R. W. Harned, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

### STINKBUGS

Four species belonging to the family Pentatomidae, namely, Euschistus impictiventris Stahl, Chlorochroa sayi Stahl, Thyanta custator Fab., and C. ligata Say, did considerable damage to cotton during the summer and fall of 1935 in irrigated sections of the Southwest. These insects, by virtue of their boll-puncturing habits, are responsible for lint stains that lower the grade of cotton and they may also cause shedding of smaller bolls and the production of inferior lint on pierced seeds within the boll. In Arizona E. impictiventris was decidedly the most important species with respect to abundance and amount of injury, with C. sayi and T. custator following closely in the order named. C. ligata was numerous in only a few fields in Graham County. As a rule, however, it was of no importance. As shown by the internal cell proliferations formed about puncture wounds, the percentage of injured bolls in 1935 in Arizona was 27.2 percent, as compared with 23.4 percent injured bolls noted in 1934. In the vicinity of Presidio, Tex., pentatomid injury to cotton was also severe, C. ligata, C. sayi, and T. custator being the insects concerned. By the end of August, 33.3 percent of the bolls 35 days old had been damaged, 23.7 percent of them severely. Unverified reports from the San Joaquin Valley of California indicate that pentatomids were severely injuring cotton bolls in that area during 1935. (L. D. Christenson, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

### PERIODICAL CICADA

Brood IX appeared this year in considerable numbers in a small area in southeastern West Virginia, western Virginia, and western North Carolina, which is the center of the brood. Positive observations were made in the following localities (names of counties underscored):

Indiana: Lake, Crown Point.

North Carolina: Alleghany, Laurel Springs, Piney Creek, Roaring Gap, Sparta, Twin Oaks, Whitehead; Ashe; Forsyth, Vienna; Rockingham; Rutherford, Lake Lure; Surry, Mount Airy; Watauga, Deep Gap; Wilkes, northeastern part.

Virginia: Alleghany, Covington; Augusta, Staunton; Bland, Bastian;  
Charlotte, Charlotte Court House; Franklin, Callaway;  
Henry; Montgomery, Elliston; Pittsylvania, Gretna,  
Rocky Mount; Pulaski; Roanoke, Roanoke; Wythe.  
West Virginia: Berkeley; Fayette, Gauley Bridge; Greenbrier, Maxwelton,  
White Sulphur Springs; Mercer, Bluefield, Princeton;  
Wood, Parkersburg.

Brood XXI was represented this year by only one record. The insect was heard at Pelahatchie, Rankin County, Miss. (Broods IX and XXI of the periodical cicada scheduled to appear this year were treated in a supplement to Insect Pest Survey Bulletin, vol. 15, no. 2, which gives maps and locality records for all previous occurrences.)

#### ASIATIC BEETLES

There has been little increase in 1935 in the area known to be infested by Anomala orientalis Waterh. One beetle was found at a new location in New Jersey at Springfield, in Union County. There have been a few reports of minor turf injury from feeding by larvae. In 1935 the Asiatic garden beetle (Autoserica castanea Arrow) continued to spread. On Long Island all of Nassau County has now been covered and the insect has penetrated into the western part of Suffolk County. Prior to 1935, the southern part of Nassau County had been only lightly infested, but this year the insect has increased in numbers, resulting in more feeding on ornamentals and in vegetable gardens along the south shore of Long Island. The infestation in northern New Jersey now covers all of Essex, Hudson, and Union Counties and embraces parts of Bergen, Passaic, Middlesex, and Monmouth Counties. The old infestation in Pennsylvania located in the Philadelphia suburban area has also shown a gradual increase in area. In 1935 beetles were fully as destructive to ornamental plants as in previous years, but fewer cases of injury to vegetable plants than in 1933 and 1934 were reported. The insect was definitely more of a nuisance in 1935 than in any previous year in its habit of flying about and alighting on persons in brightly lighted places. (C. H. Hadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### OBLONG LEAF WEEVIL

The oblong leaf weevil (Phyllobius oblongus L.) was very abundant and caused noticeable injury to elm and maple near Painesville, Ohio, where it was first discovered in 1934. This weevil was first recorded in this country in 1923 from near Rochester, N. Y., where it was attacking elms. The Survey has received no further reports on this infestation, although a report of injury to pear foliage was received from Penfield, N. Y., a few miles from Rochester. The insect is widely distributed in Europe, where it is a pest of various trees and is especially injurious to fruit trees.



## AN INTRODUCED WEEVIL

Three specimens of a Japanese weevil, Myloccerus castaneus Roelofs, were taken on wild grape, oak, and ash (?) a short distance from Montclair, N. J., on June 30, 1935. This weevil was first taken in the United States in this locality in August 1933. Although this species is not recorded as a pest in Asia, the genus contains many species that are crop pests, and one species is a very serious pest of cotton in India.

## JAPANESE BEETLE

The area of continuous infestation of the Japanese beetle is now estimated at 11, 400 square miles, which is an increase of about 1,700 square miles. During the year the area was advanced northward into the highlands of New Jersey, a notable advance in view of the retardation noted in that section in the past 2 years. The principal local infestations instrumental in enlarging the area of continuous infestation were those developed in the vicinity of New York City and Brooklyn; at Reading and Lancaster, in Pennsylvania; between Havre de Grace and Aberdeen, Md.; and at Dover, Del. Trapping disclosed light infestations in the following 34 places where the beetle had never been taken before: Bangor, Maine; Emmitsburg, Md.; Akron, Chillicothe, Conneaut, Hills and Dale Village (suburb of Canton), Lancaster, Marietta, Salem, Toledo, and Wooster, Ohio; Charlotte, Goldsboro, High Point, Lumberton, Oxford, Sanford, Statesville, Wake Forest, N. C.; Bon Air, East Highland Park (Henrico County), Lovettsville, Petersburg, Petersburg Pike (Dinwiddie County), Pulaski, Sandston, Waynesboro, Westham, Westhampton, and Westover Hills (Charles City County), Va.; Chester, Huntingdon, Moundsville, and Parkersburg, W. Va. Judging from the extent of obvious injury, the infestation was decidedly heavier than in 1934 in practically all sections of the range where conditions were favorable, as in western New Jersey, southeastern Pennsylvania, and northern Delaware. However, in much of eastern New Jersey, including Monmouth County, the Pine Barrens, and the coastal section, the infestation remained about on a par with that of a year ago, and in many places appeared to be less marked. In Cape May County there was a marked increase.

## SMALLER EUROPEAN ELM BARK BEETLE

Information regarding the distribution of Scolytus multistriatus Marsh., a known vector of the Dutch elm disease fungus, was given in the Insect Pest Survey Bulletin, Summary for 1934, (vol. 14, no. 10, p. 345). At that time its occurrence was recorded in localities in two distinct areas, one area being in eastern Massachusetts and the other including parts of southwestern Connecticut, southeastern New York, the northern half of New Jersey, and southeastern Pennsylvania. In 1935 additional information regarding the distribution of the species was obtained by workers of the Bureau of Entomology and Plant Quarantine at Morristown, N. J., and records obtained by State workers in Massachusetts and Connecticut have been supplied by W. B. Becker and B. J. Kaston, respectively. Although many of the additional towns from which the insect has been recorded during 1935 are located within two areas from which infestations had been previously reported, a number of them lie outside the areas known to be infested in 1934. In some instances, however, proof is not available that the infestation is general out to



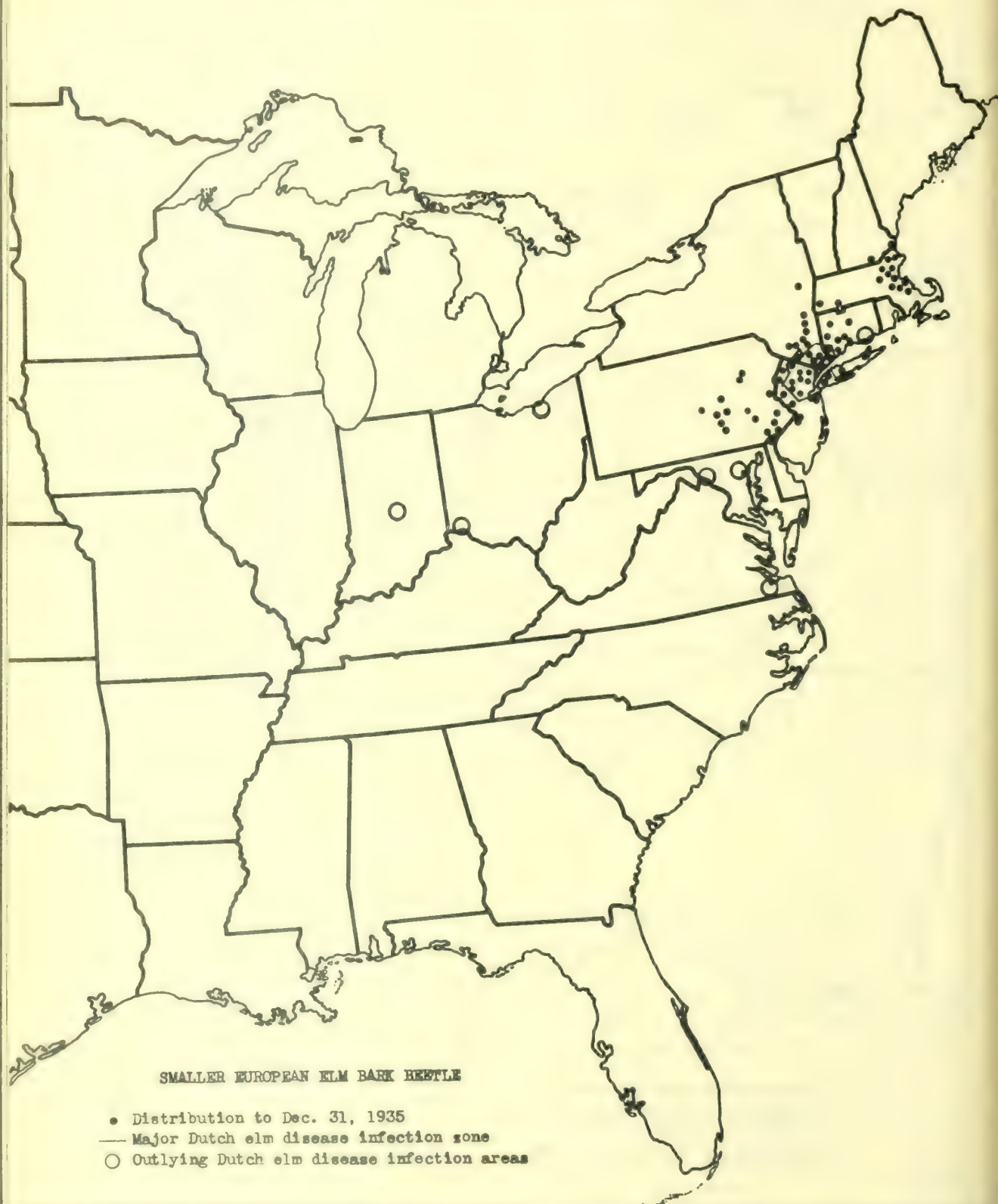
UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE



UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE



these outlying towns; however, it is known that the infestation in eastern Massachusetts extends north over the New Hampshire line, as the beetle has been reported from Nashua and North Hampton. It is also known that the other infested area extends south into the extreme northern end of Delaware, where it has been taken at Claymont. Outlying reported infestations, which may or may not be isolated ones, having been reported from Egremont and Westfield, Mass.; Crescent, N. Y.; and Torrington and Glastonbury, Conn. It is of interest to note that while this insect is abundant in the major Dutch elm disease zone centered around New York City, it has not been found in outlying infected areas in Indianapolis, Ind., Cleveland and Cincinnati, Ohio, Baltimore and Brunswick, Md., Norfolk, Va., or Old Lyme, Conn. The larger European elm bark beetle (S. scolytus Fab.), considered the most important carrier of the disease in Europe, has not been found in the United States. (T. H. Jones, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### GYPSY MOTH

The hatch of egg clusters of the gypsy moth in the spring was quite variable, the low temperatures during the winter of 1934-35 being responsible for the killing of many clusters. However, the killing temperatures were not uniform in many sections of the infested areas, as considerable hatching of exposed egg clusters was noted in some localities. Egg clusters below the snow line showed a high percentage of hatch. Larvae were not abundant enough to cause complete defoliation until they had reached maturity. During the summer a total of 540,769 acres of woodland was partially or totally defoliated, an increase of almost 50,000 acres over 1934. In Maine and New Hampshire the areas of defoliation were increased quite extensively. In Massachusetts there was a slight decrease in the eastern and southeastern sections; however, in the western part of Worcester County and in sections of Franklin and Hampshire Counties east of the Connecticut River heavy defoliation occurred, the areas affected being much more extensive than in 1934, and much greater than ever before recorded in this section of the State. Some of the areas entirely defoliated in 1934 suffered the same degree of injury in 1935. In Rhode Island there was a slight decrease in defoliation, while in Vermont there was a slight increase, and in Connecticut a considerable increase was noted. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### BROWN-TAIL MOTH

During the fall and winter of 1934-35 brown-tail webs were cut over most of the infested area in New Hampshire and Massachusetts and some were cut in southern Maine by the State forces. In Maine slightly over 72,000 webs were cut and destroyed; in New Hampshire over 1,500,000 were destroyed; and in Massachusetts over 168,000. During the summer of 1935 there were no reports of extensive defoliation, although in one or two towns in north-eastern Massachusetts slight defoliation was noted in limited areas. Throughout the insect's range the infestation is rather light, being somewhat heavier in scattered towns. There are some areas in southern Maine, southern New Hampshire, and southeastern Massachusetts where the winter webs are quite noticeable on fruit trees. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)



## SATIN MOTH

In some sections of the infested area in New England, particularly in Massachusetts, records obtained during the summer of 1935 indicate that the satin moth is on the increase. Although no extensive areas of defoliation were noted, the insect was abundant enough to cause noticeable defoliation in 29 towns widely scattered over the entire infested area in Massachusetts. For the most part, this defoliation was confined to a few trees. In Rhode Island noticeable defoliation was found on a few trees in one town. In New Hampshire some defoliation was noted in three towns scattered widely over the infested area, but it was confined to a few trees in each place. There were no records of this insect's being abundant enough in any town in Maine to cause noticeable defoliation. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.) Note.---A survey conducted in Oregon in July revealed the presence of the insect in Benton, Clackamas, Linn, Marion, Multnomah, Polk, Washington, and Yamhill Counties. No damage was being done, however, except near Gervais, Marion County, the site of the original infestation in Oregon. R. T. Webber, of the Bureau of Entomology and Plant Quarantine, reported that in Washington infestations in residential sections outnumber those in woodlands. The principal woodland infestations lie between Everett, Snohomish County, and Bellingham, Whatcom County, where willows seem to be the favored food plant. Other woodland infestations of an acre or more have developed to complete defoliations in Pierce and Cowlitz Counties. Mr. Webber says: "Five species of parasites of European origin, namely, Apanteles solitarius (Ratz.), Meteorus versicolor Wesm., Eupteromalus nidulans (Thom.), Rogas unicolor Wesm., and Compsilura concinnata Meig. were liberated (in western Washington) and all but R. unicolor were recovered. Only one species, A. solitarius, has established itself so well that its effectiveness is now apparent over the entire territory. Parasitization by this species in the localities of host abundance will reach 11.8 percent, increasing in its effectiveness in localities of host scarcity where it attained a maximum of 32.8 percent."

## CANKERWORMS

Cankerworms occurred in outbreak numbers over much of the Northeastern States, with a severe infestation centering in southeastern New York and New Jersey and extending into Maine. Scattered infestations occurred in northwestern Ohio, Illinois, western North Carolina, southeastern Wisconsin, southern Iowa, Missouri, much of Kansas, and the Sacramento Valley of California. Severe defoliation of forest, shade, and fruit trees was reported. The fall species, Alsophila pometaria Harr., was most frequently named as causing the injury, although the spring species was commonly represented. A report of A. pometaria from Salt Lake County, Utah, gave a new State record for the species.

## FOREST TENT CATERPILLAR

A small isolated infestation of the forest tent caterpillar was reported from the coast counties of Mississippi and across the State line in Washington and Saint Tammany Parishes, La., the last of April and the first of May. A more extensive infestation developed later in the season in southeastern New York, and in Connecticut, Massachusetts, Vermont, New Hampshire,

and the southern half of Maine. Considerable defoliation of various trees was reported. The insect was reported in considerable abundance on raspberry in the northern point of the Southern Peninsula of Michigan. It was reported from northeastern Minnesota as defoliating thousands of acres of birch, poplar, and willow.

#### BAGWORM

A severe outbreak of the bagworm occurred over most of the country east of the Mississippi River, especially from a line drawn from central Ohio, Indiana, and Illinois southward to include Kentucky, Tennessee, Alabama, and Mississippi. Isolated infestations were reported from southeastern Nebraska and central Texas.

#### A NATIVE WEEVIL

The following note, dated October 1, on Agasphaerops nigra Horn, was received from C. F. Doucette: "Serious injury to bulbs and underground stems of Lilium longiflorum by larvae has been observed in the southwestern coastal area of Oregon. In one planting about 15 percent of the bulbs were attacked, and in spots 100 percent were attacked. There is evidence that the infestation originated from native lily bulbs growing in brushy areas near the plantings. It is apparent that the weevil is a real menace to the production of this species of lily bulb in this district." This is the first record of damage by this weevil to be received by the Insect Pest Survey. Leng, in his Catalogue of the Coleoptera of America North of Mexico, records the weevil as occurring in California.

#### SCREW WORM

Infestations of animals by screw worms were observed in the southern part of Georgia and in northern and central Florida during January and February 1935. The heavy infestation in southeastern Louisiana, southern Mississippi, and southwestern Alabama was completely wiped out during the winter of 1934-35. In April and early in May a few scattered cases began to appear in central and western Georgia and in southeastern Alabama. From the South, where the pest successfully overwintered, it spread northward as far as the southern boundary of North Carolina, into southeastern Tennessee, and westward through the southern half of Alabama to the eastern Mississippi line, with only a few cases in the northern Alabama counties. For some reason, probably owing to the intensive campaign against the pest conducted by the Bureau and to certain ecological factors not yet determined, screw worm flies did not become reestablished in Mississippi and southeastern Louisiana in 1935. As the season advanced, the incidence of infestation increased until the peak was reached late in the summer or fall. Of the Southeastern States, Florida probably suffered the greatest damage from the pest, because of the longer season of fly activity and more favorable climatic conditions, which permitted the building up of a larger fly population. Approximately 90 percent of the infestations occurred in cattle and hogs with the number of infestations in each of these two classes of animals about equal. As a result of the educational and control campaign, the screw-worm incidence in 1935 in the Southeast was not as high as in 1934. The highest percentages of infestation recorded for any weekly period during the 1935 season for the



various States are as follows: Georgia, 4.4; Florida, 4.2; Alabama, 0.5; Louisiana, 1.0; South Carolina, 9.8; and southeastern Texas, 1.6. The death loss was even more markedly reduced. In the Southwest in 1935 observations indicated that the primary screw worm fly was able to overwinter, at least as far north as Uvalde, Tex., as infestations occurred in January and February in that locality. The first cases in the vicinity of Menard, Tex., were observed during the first half of April. Owing to the mild winter and subsequent unusually favorable climatic conditions for fly propagation, the pest increased in enormous numbers, causing the most serious loss among livestock experienced in recent years. Fairly authentic data obtained from ranchmen in this State show that in certain classes of livestock from 16 to 25 percent of the animals were infested, with a mortality rate of about 6 percent among the infested stock. In New Mexico, Arizona, California, Oklahoma, Kansas, and Arkansas the screw worm was unusually abundant and the losses were comparatively heavy. Outbreaks occurred in many localities in Illinois, Iowa, Nebraska, Missouri, Indiana, and Kentucky. In these States many thousands of animals were infested and a good many were killed. These outbreaks were apparently started by shipments of infested animals into these States, mainly from the Southwest. After being introduced into these new areas, the fly was able to maintain itself and, by natural dissemination and the intrastate shipment of animals, the infestation spread rapidly from the points of introduction. (F. C. Bishopp, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### HOUSE CRICKET

During 1935 the house cricket was reported as being extremely numerous in city dumps and houses at Lyons, Utica, and Auburn, N. Y., Little Falls, N. J., Niles, Mich., in the northeastern section of Washington, D. C., and at Clarendon and Lyon Park, Va. In all these localities the crickets bred to large numbers in the dumps and later, during the August-October period, flew or crawled in swarms into nearby houses, making a nuisance of themselves by crawling everywhere, by their chirping, and by destructive attacks on shoes, clothing, rugs, drapes, umbrella covers, and other fabrics. (E. A. Back, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### A SCALE INSECT

A scale insect, Lepidosaphes halli Green, was discovered on Prunus spp. and Amygdalus spp. in the grounds of the United States Plant Introduction Gardens at Chico, Butte County, Calif., on February 5, 1934. An eradication campaign was immediately inaugurated and a report in June 1935 indicated that the insect had been completely wiped out. Foreign literature on the species is limited to the paper published in 1923 by E.E. Green, recording the original description from specimens collected near Giza, Egypt.

Correction.--The last two lines of the note on cabbage insects by C. O. Bare in Insect Pest Survey Bulletin, vol. 15, no. 8, p. 379, (October 1935) should be corrected to read: Striped cabbage worm is almost if not the principal pest of cabbage in western North Carolina. It has never been seen on cabbage at Charleston, S. C.



# FOREIGN INSECTS

Specimens of the following foreign insects have been identified from collections made in the United States.

Among specimens of Lepidoptera received for identification was one small moth, Laspeyresia coniferana Ratz. According to the associated data, this specimen was reared from larvae found in Pinus resinosa collected at Cross River, N. Y., on June 27, 1934. The species apparently has not previously been reported from the United States. (Det. C. Heinrich)

Six specimens of a weevil collected on June 1, 1935, at Bellingham, Wash., have been identified as Ceutorhynchus assimilis Payk., a European species not previously reported from North America. Another specimen of the species is at hand from Vancouver, British Columbia, having been taken on May 28, 1931. (L. L. Buchanan)

Among leafhoppers received for identification were included specimens collected on mignonette at Bar Harbor, Maine, on August 25, 1934. These specimens have been placed as the European species Eupteryx auratus L. This seems to be the first record of the occurrence of this insect in North America. (P. W. Oman)

On June 27 at Nicolaus, Calif., and July 5 at Puyallup, Wash., P. W. Oman collected specimens of a leafhopper on cottonwood which he has identified as Idiocerus albicans Kbm., apparently the first records for this species from North America. There has also been received for identification a single female of an Idiocerus, collected at Pullman, Wash., on October 13, 1929, which Mr. Oman tentatively placed as I. fulgidus Fab. Both are European forms living on Populus. Mr. Oman suggests that, if the latter identification is correct, all the above-mentioned specimens probably represent but a single species, as material in the National Collection under the name albicans does not appear to be specifically distinct from that considered to be fulgidus.

Mr. Oman has had occasion to refer to and identify certain leafhoppers he collected in New England in August 1934. Of these, two are well-known European species but apparently represent new records for North America. These are Athysanus argentatus Fab. and Macropsis tiliae Burm. The first is apparently a grass feeder, as are closely related species of the genus, while the second, as the name suggests, lives on Tilia sp. The latter species is commonly referred to by European workers as Pediopsis tiliae Burm. M. tiliae was collected at New Haven, Conn., and A. argentatus in the White Mountains of New Hampshire. (P. W. Oman)

First occurrence in America of the ichneumonid Bathyplectes tristis (Grav.), a European parasite of the clover leaf weevil (Hypera punctata Fab.), was recorded when two specimens, reared October 7, 1935, at Arlington Farm, Va., were identified as this species. (R. A. Cushman)

On several occasions in the past 2 years, F. D. DeGant, of Cleveland, Ohio, has sent in specimens of an ichneumonid which he had reared, along with its wasp host, from rose stems in his garden. The parasite has been identified by R. A. Cushman as Perithous divinator (Rossi), a European species not heretofore recorded from North America. Grace Sandhouse has identified the wasp, with some question, as Pemphredon lethifer (Shuckard), a species recorded in European literature as one of the hosts of P. divinator. It has not previously been recorded from North America, although the collection of the National Museum contains specimens from Rosedale, Mass.; Philadelphia, Pittsburgh, and North East, Pa.; Baltimore, Md.; Washington, D. C.; Cleveland, and Wooster, Ohio; Detroit, Mich.; Chicago, Ill.; and Webster Grove, Mo. All but the Philadelphia specimen, which was captured in 1909, have been collected since 1922. Many of them were reared from rose or blackberry stems.

Specimens reared from elm logs at Morristown, N. J., and in Westchester County, N. Y., were identified as Entedon leucogramma (Ratz.), a European species parasitic upon Ecceotogaster spp., and not previously recorded from America. (Det. A. B. Gahan)

The first record of the occurrence of the sawfly Pristiphora geniculata Htg. in the United States has been established by the identification of material in the collection of the National Museum by H. H. Ross, of the Illinois State Laboratory of Natural History. The specimens are from North Adams, Mass., Delhi and Haines Falls, N. Y., and Mount Desert Island, Maine, and with one exception were reared from mountain ash, the first collection date being in 1926.

A scale insect, Lepidosaphes chinensis Chamb., was taken on orchids (Cymbidium sp.) in a glass house at Lincoln Park, Los Angeles County, Calif., in July 1934. (Det. H. Morrison)

The first record in the United States of the sugarcane mite (Tarsonemus bancrofti Michael) comes from a quarantine greenhouse at Arlington Farm, Va. Since the discovery of the infestation, all the sugarcane in the vicinity of the infested house has been destroyed and the house has been fumigated. Note.--In October the mite was discovered on sorghum growing on experimental plats at Houma, La. Immediate steps were taken to eradicate the pest, which is seriously injurious to sugarcane in many tropical countries and islands.

Mr. Ewing reports the third record for the United States of Eutetranychus latus (Cen. & Fanz.) in the identification of specimens collected on boxwood at Arlington Farm, Va., on March 6, 1934.

(C.F.W. Muesebeck, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

THE INSECT PEST SURVEY  
BULLETIN

---

Volume 15

1935

Index

---

BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING





# INSECT PEST SURVEY BULLETIN

Vol. 15	1935	Index
		<u>Page</u>
Ballou, C. H.: "Insect notes from Costa Rica in 1934"-----4 (Sup.)		163-212
Beck, E. W., and Bradley, W. G.: "Colonization of foreign parasites of the European corn borer in the United States for 1935"-----9 (Sup.)		433-441
Bradley, W. G., and Beck, E. W.: "Colonization of foreign parasites of the European corn borer in the United States for 1935"-----9 (Sup.)		433-441
"Chinch bugs in hibernation, trial surveys of, November 1934 to March 1935", article by C. M. Packard -----3 (Sup.)		103-109
"Costa Rica, insect notes from in 1934", article by C. H. Ballou-----4 (Sup.)		163-212
"European corn borer, foreign parasites of, colonization in the United States for 1935", article by W. G. Bradley and E. W. Beck-----9 (Sup.)		433-441
"European corn borer, report on status of in 1935", article by A. M. Vance-----9 (Sup.)		423-431
"Hessian fly infestation at harvest time in 1935", article by C. M. Packard-----6 (Sup.)		323-324
"Insect notes from Costa Rica in 1934", article by C. H. Ballou-----4 (Sup.)		163-212
Insect Pest Survey reports, list-----1		1-4
Packard, C. M. --		
"Hessian fly infestation at harvest time in 1935"-----6 (Sup.)		323-324
"Trial surveys of chinch bugs in hibernation, November 1934 to March 1935"-----3 (Sup.)		103-109
"Parasites, foreign, of European corn borer, colonization in the United States for 1935", article by W. G. Bradley and E. W. Beck-----9 (Sup.)		433-441
"Periodical cicada, the two broods scheduled to appear in 1935"-----2 (Sup.)		59-61
Reporters for Insect Pest Survey Bulletin, list-----1		1-4
Vance, A. M.: "Report on the status of the European corn borer in 1935"-----9 (Sup.)		423-431

(Common names listed separately at the end)

	No.	Page
<i>Ablethia longana</i> Haw. -----	5	242
<i>Acantholonia viriscens</i> Stahl -----	4 (Sup.)	198
<i>Acanthocephala declivis guatemalena</i> Dist. -----	4 (Sup.)	179
<i>Acanthoscelides obtectus</i> Say -----	2	57
<i>Achorutes matorus</i> Folsom -----	5	244
<i>Aconophora laticornis</i> Walk. -----	4 (Sup.)	199
<i>Aconophora pallescens</i> Stahl -----	4 (Sup.)	199-200
<i>Acrididae</i> -----	1	7
	2	29
	3	65
	4	111, 113 -114
	5	213, 215,
		217-218
	6	273, 275-276
	7	327, 330
	8	363, 364, 367
	9	395, 397-398
	10	444-445
<i>Acrobasis juglandis</i> LeB. -----	2	39
	4	137
	6	293-294
<i>Acrosternum hilaris</i> Say -----	6	291
	7	325-333
	8	379
	9	398, 407
<i>Acrosternum marginatum</i> P. de B. -----	4 (Sup.)	179
<i>Acutalis fusconervosa</i> Fairm. -----	4 (Sup.)	200
<i>Adalia bipunctata</i> L. -----	9	414
<i>Adelphocorus rapids</i> Say -----	7	351
	10	456
<i>Aedes aegypti</i> L. -----	8	389, 393
<i>Aedes cantator</i> Coq. -----	3	96
<i>Aedes hirsuteron</i> Theob. -----	7	358
<i>Aedes taeniorhynchus</i> Wied. -----	7	358
<i>Aedes vexans</i> Meig. -----	7	358
<i>Aegeria exitiosa</i> Say -----	1	11
	2	37-38
	3	79-80
	4	134
	5	236-237
	6	290-291
	7	339
	8	373
	9	402-403
<i>Aegeria pictipes</i> G. & R. -----	2	38
	3	80
	4	134
	7	339
	9	403



<i>Aeolus dorsalis</i> Say -----	4	119-120
<i>Aeolus</i> sp. -----	4	119-120
<i>Aethalion quadratum</i> Fowl. -----	4 (Sup.)	200
<i>Aethalion reticulatum</i> L. -----	4 (Sup.)	200
<i>Agallia novella tropicalis</i> Van D. -----	4 (Sup.)	185
<i>Agasphaerops nigra</i> Horn -----	10	461
<i>Agoneotettix deorum</i> Scudd. -----	10	445
<i>Agonoderus lineola</i> Fab. -----	2	45-46
<i>Agonoderus pallipes</i> Fab. -----	2	45-46
<i>Agraulis junio</i> Cr. -----	4 (Sup.)	205
<i>Agraulis poeyi</i> Butl. -----	4 (Sup.)	206
<i>Agrilus anxius</i> Gory -----	4	152
	7	353
<i>Agriolimax agrestis</i> L. -----	1	9
<i>Agriotes sublineatus</i> Champ. -----	4 (Sup.)	173
<i>Agromyza citreifrons</i> Mall. -----	9	413
<i>Agromyza pervicornis</i> Loew -----	5	229
<i>Agrotis c-nigrum</i> L. -----	5	220
	7	327
<i>Agrotis unicolor</i> Walk. -----	4	114
<i>Agrotis ypsilon</i> Rott. -----	2	29
	3	65-66
	4	147
	7	330
<i>Alabama argillacea</i> Hbn. -----	4	148
	5	214, 256
	6	305
	7	326, 348-349
	8	351-352
	9	396, 410, 411
	10	454
<i>Alchisme grossa</i> Fairm. -----	4 (Sup.)	200
<i>Aleurocanthus woglumi</i> Ashby -----	4 (Sup.)	135
<i>Aleyrodidae</i> -----	3	93, 101
<i>Aleurothrixus howardi</i> Quaint. -----	4 (Sup.)	135
<i>Aligia modesta</i> O. & B. -----	4 (Sup.)	138
<i>Alcophila pometaria</i> Harr. -----	1	6, 13
	2	28, 43
	3	90
	4	151
	5	259
	6	308
	10	460
<i>Amblyomma maculatum</i> Koch -----	9	421
<i>Anorbis humerosana</i> Clem. -----	4	130
<i>Anabrus simplex</i> Hald. -----	1	7
	4	114
	5	213, 213-219
	6	276
	9	395, 398
	10	445
<i>Anacentrinus</i> spp. -----	1	10

<i>Anacentrinus subnudus</i> Buchanan -----	1	10
<i>Anaphothrips obscurus</i> Mull. -----	6	282
<i>Anarcia lineatella</i> Zell. -----	6	291
	8	372
<i>Anasa andrewsi</i> Guer. -----	4 (Sup.)	179
<i>Anasa armigera</i> Say -----	5	250
<i>Anasa scorbutica</i> Fab. -----	4 (Sup.)	179
<i>Anasa tristis</i> DeG. -----	6	301-302
	7	326, 345
	9	409
<i>Anastrepha fraterculus</i> auct. -----	1	12
	6	294
	10	449
<i>Anastrepha ludens</i> Loew -----	1	11-12
	6	294
	10	449
<i>Anastrepha pallens</i> Coq. -----	1	12
	6	294
	10	449
<i>Anastrepha serpentina</i> Wied. -----	1	12
	4 (Sup.)	178
	6	294
	10	449
<i>Anastrepha</i> spp. -----	1	11-12
	6	294
<i>Anastrepha striata</i> Schin. -----	1	12
	4 (Sup.)	178
	10	449
<i>Ancylis comptana</i> Froel. -----	2	46
	4	144
	5	251-252
	6	302
	9	409
<i>Andricus clavulus</i> O. S. -----	4	154
<i>Andricus cornigerus</i> O. S. -----	3	92
	4	154
<i>Angitia hellulae</i> Vier. -----	1	6, 15
	2	44
	4	142
<i>Anisoscelis gradadia</i> Dist. -----	4 (Sup.)	179
<i>Anisota rubicunda</i> Fab. -----	8	386
	9	414
<i>Anisota senatoria</i> S. & A. -----	8	386
	9	414
<i>Anomala orientalis</i> Waterh. -----	10	457
<i>Anomala</i> sp. -----	3	82
<i>Anomala testaceipennis</i> Blanch. -----	4 (Sup.)	174
<i>Anopheles punctipennis</i> Say -----	8	389
<i>Anopheles quadrimaculatus</i> Say -----	8	389
<i>Anteos chlorinde</i> Godt. -----	4 (Sup.)	206
<i>Anthicus asphaltinus</i> Champ. -----	4 (Sup.)	165
<i>Anthocomus basilis</i> Erichs. -----	4 (Sup.)	173

Anthonomus eugenii Cano -----	1	17
	3	64,89
	4	144
	5	214,252
	6	303
	7	346
	8	380
	10	450-451
Anthonomus grandis Boh. -----	2	57
	3	101
	4	112,146
	5	214,253-255
	6	304-305
	7	326,347-348
	8	381,392
	9	396,410
	10	451-452
Anthonomus grandis thurberiae Pierce-----	4	146-147
	9	410
	10	452
Anthonomus signatus Say -----	4	143
	5	252
Antianthe expansa Germ. -----	4 (Sup.)	201
Anticarsia gemmatilis Hbn. -----	7	331
Antodice cretata Bates -----	4 (Sup.)	165
Amuraphis maidi-radiciis Forbes -----	4	148
	5	257
	10	455
Amuraphis persicae-niger Smith -----	4	135
	5	237
Amuraphis roseus Balz. -----	2	35
	3	76,77
	4	130-131
	5	234
	9	395,402
Amurogryllus muticus DeG. -----	5	257
Anypotactus exilis Boh. -----	4 (Sup.)	176
Apanteles solitarius Ratz. -----	5	216
	10	460
Apanteles sp. -----	9 (Sup.)	435
Apanteles thompsoni Lyle -----	9 (Sup.)	435
Aphididae -----	2	35
	3	76-77,85,92
	4	112,130-131,148
	5	234,257
	6	312
	10	448
Aphis allii Licht. -----	7	346
Aphis forbesi Weed -----	1	6,16-17
	2	46



<i>Aphis gosypii</i> Glov. -----	4 (Sup.)	156
	5	257
	6	274, 301, 306
	7	326, 350
	8	330, 392
	9	412
	10	455
<i>Aphis illinoiensis</i> Shim. -----	4 (Sup.)	156
<i>Aphis malis</i> Fitch -----	1	8
	7	335-336
	8	363, 369
<i>Aphis medicaginis</i> Koch -----	2	39
	5	257
	10	455
<i>Aphis nerii</i> Fonscol. -----	3	95
<i>Aphis pumicepae</i> Hottes -----	4	157
<i>Aphis pomi</i> DeG. -----	2	35
	3	76, 77
	4	130-131
	4 (Sup.)	156
	5	234
<i>Aphis spiraeicola</i> Patch -----	1	6, 12
	2	27, 39
	3	82
	4	137, 157
	4 (Sup.)	156
	5	240
<i>Aphis viburnicola</i> Gill. -----	4	157
	5	267-268
<i>Aphomia gularis</i> Zell. -----	1	25
<i>Aphrophora salicis</i> DeG. -----	5	266
<i>Archimorus scutellaris</i> Stahl -----	4 (Sup.)	179
<i>Archytas analis</i> Fab. -----	6	277
<i>Argas miniatus</i> Koch -----	6	320
<i>Arilus cristatus</i> L. -----	7	358
<i>Artipus psittacinus</i> Gyll. -----	8	392
<i>Arvelius albopunctatus</i> DeG. -----	1	14-15
	7	343
<i>Ascia protodice</i> B. & L. -----	3	87
<i>Ascia rapae</i> L. -----	1	16
	2	43-44
	3	87
	4	142
	6	274, 299-300
	8	364, 379
	9	408
<i>Aspidiotus ancylus</i> Putn. -----	2	49-50
<i>Aspidiotus camelliae</i> Sign. -----	4 (Sup.)	195
<i>Aspidiotus destructor</i> Sign. -----	8	392
<i>Aspidiotus forbesi</i> Johns. -----	7	325, 340
	10	450
<i>Aspidiotus juglans-regiae</i> Comst. -----	4	152

<i>Aspidiotus perniciosus</i> Comst. -----	1	5,11
	2	27,35-36
	3	77-78
	4	131-132
	5	216
	7	338
	8	372
	9	402,403
<i>Aspidiotus uvae</i> Comst. -----	3	81
<i>Asterolecanium bambusae</i> Edv. -----	1	20
<i>Asterolecanium pustulans</i> Coll. -----	4 (Sup.)	195
<i>Asterolecanium variolosum</i> Ratz. -----	9	414
<i>Atlysianus argentatus</i> Fab. -----	10	463
<i>Atta sexdens</i> L. -----	4 (Sup.)	201-205
<i>Atta texana</i> Buckl. -----	2	57
	4	161
<i>Attagenus piceus</i> Oliv. -----	1	162
<i>Aulacaspis pentagona</i> Targ. -----	1	21
	4 (Sup.)	195
<i>Aulacizes panamensis</i> Fowl. -----	4 (Sup.)	188
<i>Aulacizes thunbergi</i> Stall -----	4 (Sup.)	188
<i>Aulocara elliotti</i> Thomas -----	10	445
<i>Autographa brassicae</i> Riley -----	1	16
	2	44
	3	87
	5	112
	5	250
	6	300
	8	379
	9	408
<i>Autographa californica</i> Speyer -----	3	85
	5	213,222
	6	286-287
<i>Automeris boucardi</i> Truce -----	4 (Sup.)	206
<i>Automeris rubescens</i> Walk. -----	4 (Sup.)	206
<i>Autoserica castanea</i> Arrow -----	6	295
	7	341
	10	457
<i>Azochis grisalis</i> Walk. -----	4 (Sup.)	206
<i>Bactrocera cucurbitae</i> Coq. -----	3	102
<i>Barathra configurata</i> Walk. -----	5	277
	7	332
<i>Bathyplectes curculionis</i> Thoms. -----	4	124
	5	230
	6	256
	9	401
<i>Bathyplectes tristis</i> Gray. -----	10	467
<i>Bertholdia specularis</i> H. & S. -----	4 (Sup.)	206
<i>Blapstinus rufipes</i> Csy. -----	9	101
<i>Blepharida rhois</i> Forst. -----	3	95

<i>Blissus hirtus</i> Montd. -----	3	69
	4	120
	6	280
	7	333
<i>Blissus leucopterus</i> Say -----	1	5, 8
	2	27, 32
	3	63, 69-70
	3 (Sup.)	103-109
	4	111, 121-123
	5	213, 225-226
	6	273, 282-283
	7	325, 335
	8	365, 368-369
	9	395, 400
	10	443, 445-446
<i>Bolbonota inaequalis</i> Fab. -----	4 (Sup.)	201
<i>Bolbonota insignis</i> Fowl. -----	4 (Sup.)	201
<i>Bonnetia comta</i> Fallen -----	6	305
<i>Bothriocera tinealis</i> Burn. -----	4 (Sup.)	199
<i>Bourletiella hortensis</i> Fitch -----	5	266
<i>Brachyrhinus ovatus</i> L. -----	1	11
	4	144
	5	266
	6	303
	7	359
<i>Brachyrhinus rugosostriatus</i> Goeze -----	6	303
<i>Brachyrhinus</i> spp. -----	6	302-303
<i>Brachyrhinus sulcatus</i> Fab. -----	1	11
	2	38
	7	359
<i>Bracon aticornis</i> Smith -----	9 (Sup.)	434-435, 441
<i>Eregmatothrips iridis</i> Watson -----	4	156
<i>Brevicoryne brassicae</i> L. -----	1	16
	2	45
	3	88
	3	249
	6	300
	8	380
<i>Bruchus brachialis</i> Fahraeus -----	5	213, 231
	10	448
<i>Bruchus pisorum</i> L. -----	1	25
	2	57
	9	422
<i>Bucculatrix pomifoliella</i> Clem. -----	3	76
<i>Cacoecia argyrospila</i> Walk. -----	2	35
	4	129-130
<i>Cacoecia rosaceana</i> Harr. -----	5	216
	6	312
<i>Calendra aequalis</i> Gyll. -----	5	229
<i>Calendra</i> spp. -----	3	71
	5	229



<i>Caliroa aethiops</i> Fab. -----	5	267
	6	317
<i>Calloida chryseis</i> Bates -----	4 (Sup.)	185
<i>Callidium antennatum</i> Newm. -----	5	271
<i>Callidium violaceum</i> L. -----	5	271
<i>Calligasteria elegantula</i> Jacoby -----	4 (Sup.)	165
<i>Colonycteris setarius</i> Roelofs -----	5	251
	6	273, 315
	7	356
	8	387
	10	451
<i>Calophya flavida</i> Schwarz -----	1	21
<i>Calopteron bifasciatum</i> Gorb. -----	4 (Sup.)	173
<i>Calpodes ethlius</i> Grah. -----	3	101
<i>Camula pellucida</i> Scudd. -----	2	29
	3	63, 65
	4	113
	5	215, 217, 218
	6	275-276
	7	327, 330
	8	367
	10	445
<i>Camponotus caryae</i> Fitch -----	4	161
<i>Camponotus caryae rasilis</i> Wlhr. -----	2	57
	3	100
<i>Camponotus herculeanus pennsylvanicus</i> DeG. -----	2	57
	3	161
	5	270
<i>Campoplex multicinctus</i> Grav. -----	9 (Sup.)	435
<i>Campoplex pyraustae</i> Smith -----	9 (Sup.)	435
<i>Campylocentrus hamifer</i> Fairm. -----	4 (Sup.)	202
<i>Cantharis censors</i> Lec. -----	1	155
<i>Capaneus odiosus</i> Stahl -----	4 (Sup.)	180
<i>Cardiophorus stigmaticus</i> Cand. -----	3	68
<i>Cardiophorus tenebrosus</i> Lec. -----	2	51
<i>Carneocephala sagittifera</i> Uhl. -----	4 (Sup.)	188
<i>Carpocapsa pomonella</i> L. -----	2	34
	3	64, 74-75
	4	112, 126-128
	5	213, 215, 231-233
	6	287-288
	7	328
	8	363, 365, 371
	9	395, 401
	10	448
<i>Catocala viduata</i> Guen. -----	5	240
<i>Catopsilia eubule</i> L. -----	3	367-368
<i>Cecidomyiidae</i> -----	9	415
<i>Celama sorghiella</i> Riley -----	8	370
<i>Celatoria diabroticae</i> Shin. -----	7	345
<i>Cephus siccifolius</i> Walk. -----	4 (Sup.)	136-137

<i>Cerobus cinctus</i> Mort. -----	7	328
	8	354
<i>Cerobus pygmaeus</i> L. -----	5	227
<i>Cerostipsocus venosus</i> Burm. -----	7	352-353
<i>Ceratitis capitata</i> Wied. -----	3	102
<i>Ceratomyia fuscilabris</i> Muls. -----	8	379
	9	114
<i>Ceratomyia catalpae</i> Bdv. -----	6	310-311
	8	385
<i>Ceroplastes cirripediformis</i> Comst. -----	4 (Sup.)	195
<i>Ceroplastes floridensis</i> Comst. -----	4 (Sup.)	195
<i>Cerotoma rogersi</i> Jacoby -----	4 (Sup.)	166
<i>Cerotoma</i> sp. -----	8	379
<i>Cerotoma trifurcata</i> Forst. -----	3	86
	4	141
	5	247
<i>Cerura cinerea</i> Wall. -----	9	415-416
<i>Ceutorhynchus assimilis</i> Payk. -----	10	463
<i>Chaetocnema confinis</i> Crotch -----	5	251
<i>Chalcodermus aeneus</i> Boh. -----	7	337
<i>Chalcôphana mutabilis</i> Harold -----	4 (Sup.)	166
<i>Chalopus dorsalis</i> Thunb. -----	5	263
	7	354
<i>Chauliognathus marginatus</i> Fab. -----	5	243
<i>Chelonus annulipes</i> Wesm. -----	2 (Sup.)	435
<i>Chelymorpha gressoria</i> Boh. -----	4 (Sup.)	166
<i>Chermes abietis</i> L. -----	5	265
<i>Chilocorus bivulnerus</i> Muls. -----	2	36,50
	3	77
<i>Chinaia bella</i> Bruner & Metcalf -----	4 (Sup.)	188
<i>Chionaspis americana</i> Johns. -----	3	91
<i>Chionaspis euonymi</i> Comst. -----	1	21
	2	51
	6	316
	9	417
<i>Chionaspis furfura</i> Fitch -----	8	357
<i>Chionaspis ortholobis</i> Comst. -----	6	315
<i>Chionaspis pinifoliae</i> Fitch -----	1	20
	2	50
	3	93
	4	155
<i>Chironomidae</i> -----	3	96
<i>Chlorochroa ligata</i> Say -----	10	456
<i>Chlorochroa sayi</i> Stahl -----	1	8
	2	31
	5	239
	6	280,291
	8	365
	9	398
	10	456
<i>Chlorochroa uhleri</i> Stahl -----	7	351
<i>Chlorocoris aberrans</i> Dist. -----	4 (Sup.)	180

Chorizagrotis auxiliaris Grote -----	1	5,7
	2	30
	3	66
	4	115
Chrysobothris femorata Oliv. -----	1	10
	2	27,36-37
	3	75
	7	335
	8	363,371
Chrysomphalus aonidum L. -----	3	81-82
	8	392
Chrysomphalus aurantii Mask. -----	1	5,12
	2	39
	3	82
	5	241
Chrysomphalus dictyospermi Morg. -----	4 (Sup.)	195
Chrysomphalus obscurus Comst. -----	1	19
	2	50
	9	414
Chrysomphalus tenebricosus Comst. -----	1	19
	9	414
Chrysops discalis Will. -----	9	419
Cicadella areolata Sign. -----	4 (Sup.)	185-189
Cicadella coeruleovittata Sign. -----	4 (Sup.)	189
Cicadella flaviguttata Latr. -----	4 (Sup.)	189
Cicadella lutea Sign. -----	4 (Sup.)	189
Cicadella miniaticops Fowl. -----	4 (Sup.)	189
Cicadella mollicella Fowl. -----	4 (Sup.)	189
Cicadella occatoria Say -----	4 (Sup.)	190
Cicadella pardalina Fowl. -----	4 (Sup.)	190
Cicadella pulchella Guer. -----	4 (Sup.)	190-191
Cicadella reservata Fowl. -----	4 (Sup.)	191
Cicadella sanguinolenta Coque. -----	4 (Sup.)	191
Cicadella satellites Fowl. -----	4 (Sup.)	191
Cicadella sexlineata Sign. -----	4 (Sup.)	191
Cicadella similis Walk. -----	4 (Sup.)	191
Cicadella testudinaria Fowl. -----	4 (Sup.)	192
Cicadella variegata Fab. -----	4 (Sup.)	192
Cicadellidae -----	7	335
	9	407
Cicadula maidis DeLong & Wolcott -----	4 (Sup.)	192
Cimex lectularius L. -----	9	418
Cinara strobili Fitch -----	9	415
Cincticornia pilulae Walsh -----	7	354
Cirphis unipuncta Haw. -----	3	66-67
	4	111,116
	5	213,220-221
	6	276-277
	7	331
	10	445
Clastoptera funesta Stahl. -----	4 (Sup.)	187
Cleistolophus similis Chev. -----	4 (Sup.)	176
Coccinellidae -----	4	123



<i>Coccinotus rarus</i> Rehn -----	4 (Sup.)	210
<i>Coccus acuminatus</i> Sign. -----	4 (Sup.)	196
<i>Coccus hesperidum</i> L. -----	4	156
	4 (Sup.)	196
<i>Coccus viridis</i> Green -----	3	101
	4 (Sup.)	196
	8	392
<i>Cochliomyia americana</i> Cushing & Patton -	3	102
	4	159
	5	269
	6	319
	8	390
	9	420
<i>Cochliomyia macellaria</i> Fab. -----	2	54
	4	159
	5	269
<i>Cochliomyia</i> spp. -----	1	22
	2	54
	3	64, 97
	4	112, 159
	5	268-269
	6	274, 319
	7	360-361
	8	390
	9	396, 420
	10	461-462
<i>Colaspis brunnea</i> Fab. -----	6	307
<i>Colaspis prasina</i> Jacoby -----	4 (Sup.)	166
<i>Coleophora laricella</i> Hbn. -----	1	18-19
	3	91-92
	4	112, 154
	5	214, 216, 263
<i>Coleophora malivorella</i> Riley -----	4	130
<i>Coleophora salmani</i> Heinr. -----	7	353
<i>Colgorma proxima</i> Fowl. -----	4 (Sup.)	199
<i>Collaria oleosa</i> Dist. -----	4 (Sup.)	180
<i>Colopha ulmicola</i> Fitch -----	6	312
<i>Colopterus morio</i> Erichs. -----	4 (Sup.)	173
<i>Coloptera sinuata</i> Burm. -----	4 (Sup.)	199
<i>Compsilura concinnati</i> Meig. -----	10	460
<i>Coninomus constrictus</i> Gyll. -----	6	317
<i>Conocephalus cinereus</i> Thunb. -----	4 (Sup.)	210
<i>Conotrachelus anaglypticus</i> Say -----	4	133
<i>Conotrachelus crataegi</i> Walsh -----	8	373
<i>Conotrachelus flavangulus</i> Champ. -----	4 (Sup.)	176
<i>Conotrachelus nenuphar</i> Hbst. -----	2	27, 37
	3	64, 78-79
	4	112, 132-133
	5	214, 235-236
	6	274, 289-290
	7	325, 338-339
	8	373

<i>Conotrachelus nemophae</i> Hbst. (Cont'd) ---	9	403
	10	450
<i>Conotrachelus porseae</i> Barber -----	4 (Sup.)	176
<i>Contarinia pyrivora</i> Riley -----	4	135
	5	237
<i>Copicerus irroratus</i> Swartz -----	4 (Sup.)	193
<i>Copturus constrictus</i> Champ. -----	4 (Sup.)	176
<i>Coregonis</i> sp. -----	4 (Sup.)	100
<i>Corizus sidae</i> Fab. -----	4 (Sup.)	180
<i>Corythucha ciliata</i> Say -----	7	354
<i>Corythucha gossypii</i> Fab. -----	4 (Sup.)	180
<i>Corythucha pallida ulmi</i> Osborn & Drake --	6	312
<i>Cosmopepla decorata</i> Hahn -----	4 (Sup.)	100
<i>Cosmopolites sordidus</i> Germ. -----	4 (Sup.)	177
<i>Cossula magnifica</i> Stkr. -----	2	39
	3	81
<i>Cotinis nitida</i> L. -----	2	30-31
	3	68
	4	119
	7	325, 332
<i>Crambus caliginosellus</i> Clem. -----	5	220
<i>Crambus</i> spp. -----	2	32
	5	215, 228
<i>Crambus trisectus</i> Walk. -----	7	328
<i>Cremastogaster</i> . See <i>Crematogaster</i> .		
<i>Crematogaster ashmeadi</i> Mayr -----	3	100
<i>Crematogaster laeviuscula clara</i> Emery----	3	100
<i>Cremastus flavoorbitalis</i> Cam. -----	9 (Sup.)	433-435, 437, 440-441
<i>Creontiades rubrinervis</i> Stahl -----	4 (Sup.)	180
<i>Cryptocephalus tesseratus</i> Chev. -----	4 (Sup.)	166
<i>Cryptocephalus trizonatus</i> Suffr. -----	4 (Sup.)	166
<i>Cryptochaetum iceryae</i> Will. -----	2	40
<i>Cryptococcus fagi</i> Baer. -----	1	6, 18
	6	389
	9	413
<i>Cryptothrips floridensis</i> Watson -----	2	51
<i>Ctenocephalides canis</i> Curt. -----	7	359
	9	418
<i>Ctenocephalides felis</i> Bouche -----	7	359
	9	418
<i>Ctenocephalides</i> spp. -----	7	359
<i>Culex pipiens</i> L. -----	8	389
<i>Culex quinquefasciatus</i> Say -----	8	393
<i>Culicinae</i> -----	7	329, 358
	9	389
<i>Culicoides</i> spp. -----	4	158
<i>Curculio caryae</i> Horn -----	7	340
	8	374
<i>Cylas formicarius</i> Fab. -----	1	17
	9	409
	10	450

<i>Cylindrocopterus</i> sp. -----	5	262
<i>Cyllene caryae</i> Gahan -----	2	54
<i>Cynips frondosa</i> Bass. -----	9	414
<i>Cynthia cardui</i> L. -----	4	111, 117
<i>Cyrtotylus elevatus</i> Fab. -----	4 (Sup.)	173
<i>Cyphonia clavata</i> Fab. -----	4 (Sup.)	202
<i>Cymoptus belfragei</i> Stahl -----	4 (Sup.)	199
<i>Cyrtopeltis notatus</i> Dist. -----	4 (Sup.)	180
<i>Daihinia brevipes</i> Hald. -----	4	138
<i>Dancus menippe</i> Hbn. -----	3	67
	4	117
	9	399
<i>Datana integerrima</i> G. & R. -----	5	240
	7	340, 355
	8	374
	9	416
<i>Datana ministra</i> Drury -----	9	401
<i>Deloyala testudinaria</i> Boh. -----	4 (Sup.)	166
<i>Deltocephalus flavicosta</i> Stahl -----	4 (Sup.)	192
<i>Dendroctonus brevicornis</i> Lec. -----	1	19
<i>Dendroctonus frontalis</i> Zimm. -----	5	265
<i>Dendroctonus monticolae</i> Hopk. -----	7	329
<i>Dermacentor albipictus</i> Pack. -----	5	216
<i>Dermacentor andersoni</i> Stiles -----	2	54
	7	326
	8	366
<i>Dermacentor nigrolineatus</i> Pack. -----	1	22
	2	55
<i>Dermacentor variabilis</i> Say -----	3	97
	4	159
	5	268
	7	360
<i>Diabrotica balteata</i> Lec. -----	1	14
	2	41
	3	86
	4 (Sup.)	167
	8	378
	9	405
<i>Diabrotica corrusca</i> Jacoby -----	4 (Sup.)	167
<i>Diabrotica dorsoplagiata</i> Jacoby -----	4 (Sup.)	167
<i>Diabrotica duodecimpunctata</i> Fab. -----	1	14
	2	41
	3	71, 83, 84
	4	141
	5	229
	6	285-286
	8	380
	9	400
<i>Diabrotica fulvicornis</i> Jacoby -----	4 (Sup.)	167
<i>Diabrotica nummularis</i> Harold -----	4 (Sup.)	167-168
<i>Diabrotica porracea</i> Harold -----	4 (Sup.)	168



<i>Diabrotica soror</i> Lec. -----	5	84
	6	290
	7	344
<i>Diabrotica virgifera</i> Lec. -----	2	369
<i>Diabrotica viridula</i> Fab. -----	1 (Sup.)	160
<i>Diabrotica vittata</i> Fab. -----	1	14
	3	83
	4 (Sup.)	169
	5	242-243
	6	301
	7	345
	8	300
<i>Diacrisia virginica</i> Fab. -----	5	222
<i>Dialeurodes chittendeni</i> Laing -----	2	52
<i>Dialeurodes citri</i> Riley and How. -----	1	12
	3	81
	8	375
<i>Diaphania hyalinata</i> L. -----	5	250
	6	300
	9	409
<i>Diaphania nitidalis</i> Stoll -----	5	250
	6	300
<i>Diaphron proteum</i> Gorb. -----	4 (Sup.)	165
<i>Diarthronomyia hypogaea</i> Loew -----	5	266
<i>Diatraea crambidoides</i> Grote -----	5	228
	6	285
<i>Diatraea saccharalis</i> Fab. -----	1	5,9-10
	2	33
	3	73-74
	4	125
	8	363,370,393
<i>Dicentria violacens</i> H. & S. -----	4 (Sup.)	206
<i>Dichomeris marginellus</i> Fab. -----	3	91
	5	263
<i>Diestostemma albipenne</i> Fab. -----	4 (Sup.)	192
<i>Diestostemma rugicolle</i> Sign. -----	4 (Sup.)	192
<i>Digonichaeta setipennis</i> Fall. -----	8	365
<i>Dilachnus strobi</i> . See <i>Cinara strobi</i> Fitch.		
<i>Dilachnus thujafilina</i> Del Guer. -----	2	50-51
	3	94
<i>Dinocoris tripterus</i> Fab. -----	4 (Sup.)	181
<i>Diprion simile</i> Htg. -----	9	415
<i>Dircenna klugii</i> Geyer -----	4 (Sup.)	206
<i>Dissosteira carolina</i> L. -----	2	29
	3	367
<i>Doru lineare</i> Esch. -----	4 (Sup.)	212
<i>Dorymyrmex pyramicus flavus</i> Perg. -----	4	161
<i>Drepanopterna femoratum</i> Scudd. -----	10	445
<i>Dreyfusia piceae</i> Ratz. -----	3	91
	7	353
	8	365
	9	413-414

<i>Draconetetus trachypygus</i> Burm. -----	2	30
<i>Draconetetus minus</i> Say -----	4 (Sup.)	181
<i>Draconetetus obliquus</i> H. S. -----	4 (Sup.)	181
<i>Draconetetus</i> spp. -----	3	101
<i>Eantis pallida</i> Feld. -----	4 (Sup.)	206
<i>Eccoptogaster</i> spp. -----	10	464
<i>Edithophaga gallinacea</i> Westw. -----	7	362
<i>Eopantheria eridane</i> Hbn. -----	4 (Sup.)	206
<i>Edessa cornuta</i> Burm. -----	4 (Sup.)	181
<i>Edessa junix</i> Stahl -----	4 (Sup.)	181
<i>Edessa salvini</i> Dist. -----	4 (Sup.)	181
<i>Elasmopalpus lignosellus</i> Zell. -----	4	125
	5	228
	6	285
	7	344
	8	370
	9	398
<i>Elateridae</i> -----	2	27, 31
	3	68-69
	4	119-120
	5	215, 224-225
	6	277-278
	8	364
<i>Eleodes opaca</i> Say -----	9	399-400
<i>Elleschus ephippiatus</i> Say -----	6	315
<i>Ellipes minuta</i> Scudd. -----	4 (Sup.)	210
<i>Ellopia athasaria</i> Walk. -----	5	263
<i>Ellopia fiscellaria</i> Guen. -----	8	385
<i>Empoasca fabae</i> Harr. -----	6	297, 298-299
	7	342-343
<i>Empoasca mali</i> LeB. -----	9	407
<i>Empria fragariae</i> Rohw. -----	5	252
<i>Enarmonia ratzeburgiana</i> Sax. -----	6	314
<i>Enchenopa binotata</i> Say -----	3	93
<i>Enchenopa lanceolata</i> Stoll -----	4 (Sup.)	202
<i>Entedon leucogramma</i> Ratz. -----	10	464
<i>Entomoscelis adonidis</i> Pal. -----	8	364
<i>Entylia sinuata</i> Fab. -----	4 (Sup.)	202
<i>Ephestia elutella</i> Hbn. -----	1	24
	4	145
<i>Ephestia figulilella</i> Greg. -----	1	6, 24
	4	162
<i>Epicauta cinerea</i> Forst. -----	7	341
<i>Epicauta cinerea marginata</i> Fab. -----	5	243
	7	341
	8	375
<i>Epicauta lemniscata</i> Fab. -----	5	243
	7	342
	8	375
<i>Epicauta maculata</i> Say -----	7	341
<i>Epicauta pennsylvanica</i> DeG. -----	5	243
	7	341
	8	375

<i>Epicauta vittata</i> Fab. -----	5	243
	7	341
	8	375
<i>Epicranion championi</i> Fowl. -----	4 (Sup.)	187
<i>Epilachna borealis</i> Fab. -----	4	140
	4 (Sup.)	172
<i>Epilachna corrupta</i> Muls. -----	1	15
	2	64,85-86
	3	112,140-141
	4 (Sup.)	172
	5	214,246-247
	6	274,297-298
	7	326,343-344
	8	363,378
	9	407
	10	451
<i>Epilachna defecta</i> Muls. -----	4 (Sup.)	172-173
<i>Epilachna vineta</i> Crotch -----	4 (Sup.)	173
<i>Epilachna virgata</i> Muls. -----	4 (Sup.)	173
<i>Epitrix cucumeris</i> Harr. -----	4	139
	7	342
<i>Epitrix fuscata</i> Jac.-Dav. -----	4 (Sup.)	169
<i>Epitrix parvula</i> Fab. -----	3	64,89
	4	145
	6	304
	8	377-378,392
<i>Epitrix</i> sp. -----	7	342
<i>Erannis tiliaria</i> Harr. -----	5	261
	6	309
<i>Erechtia sallaei</i> Fowl. -----	4 (Sup.)	202
<i>Eretmocerus serius</i> Silv. -----	4 (Sup.)	185
<i>Eriocampoides limacina</i> Retz. -----	6	292
	8	373
<i>Eriococcus araucariae</i> Mash. -----	4 (Sup.)	196
<i>Eriophyes avellanae</i> Mal. -----	3	81
<i>Eriophyes essigi</i> Hassan -----	1	11
<i>Eriophyes pyri</i> Pgst. -----	4	136
<i>Eriosoma americanum</i> Riley -----	5	261
<i>Eriosoma lanigerum</i> Hausm. -----	1	10
	2	35
	4 (Sup.)	186
<i>Erythroneura comes</i> Say -----	2	38-39
	3	81
	5	238-239
	6	293
	7	328
	8	374
	9	403-404
<i>Erythroneura comes ziczac</i> Walsh -----	1	21
<i>Erythroneura lawsoniana</i> Balt. -----	7	338
<i>Erythroneura obliqua</i> Say -----	7	338
<i>Esthlogena porosa</i> Bates -----	4 (Sup.)	165



<i>Estigmene acraea</i> Drury -----	3	71
	4	147
	5	222
<i>Euctheola rugiceps</i> Lec. -----	1	10
	2	34
	3	74
	4	125-126
	5	229
<i>Euglyphis melancholica</i> Butl. -----	4 (Sup.)	207
<i>Eulabis rufipes</i> Esch. -----	9	404
<i>Eulia mariana</i> Fern. -----	7	328
	8	365
<i>Eulimneria albae</i> Ell. & Sacht. -----	9 (Sup.)	435
<i>Eulophus viridulus</i> Thoms. -----	9 (Sup.)	435
<i>Eumerus tuberculatus</i> Rond. -----	2	51
<i>Euphoria candezei</i> Janson -----	4 (Sup.)	174
<i>Euphoria sepulchralis</i> Fab. -----	9	407
<i>Eupteromalus nidulans</i> Thom. -----	10	460
<i>Eupteromalus viridescens</i> Walsh -----	4	142
<i>Eupteryx auratus</i> L. -----	10 (Sup.)	463
<i>Eurhinus festivus</i> Fab. -----	4 (Sup.)	177
<i>Euscelis obscurinervis</i> Stahl -----	4 (Sup.)	192
<i>Euscelis striatulus</i> Mall. -----	8	365
<i>Euschistus bifibulus</i> P. de B. -----	4 (Sup.)	181
<i>Euschistus impictiventris</i> Stahl -----	10	456
<i>Euschistus servus</i> Say -----	6	299
<i>Eusimulium callidum</i> D. & S. -----	4 (Sup.)	178
<i>Eusimulium mediovittatum</i> Knab -----	6	320
<i>Eusimulium metallicum</i> Bell. -----	4 (Sup.)	178
<i>Eusimulium occidentale</i> Towns. -----	5	269
<i>Eusimulium ochraceum</i> Walk. -----	4 (Sup.)	178
<i>Eusimulium pecuarum</i> Riley -----	2	28,55
	3	98
<i>Eusimulium quadrivittatum</i> Loew -----	4 (Sup.)	178
<i>Eusimulium</i> spp. -----	1	22
	5	269
	6	320
<i>Eutetranychus latus</i> Can. & Fanz. -----	10	464
<i>Eutettix tenellus</i> Balz. -----	2	28,47-48
	3	80
	4	144
	5	252-253
	6	274,303
	7	346
	10	451
<i>Euxoa ochrogaster</i> Guen. -----	7	327
<i>Euxoa</i> sp. -----	3	66
	5	219
<i>Evergestis rimosalis</i> Guen. -----	2	44-45
	8	379
	10	462
<i>Exeristes roborator</i> Fab. -----	9 (Sup.)	435

<i>Faula brunneipennis</i> Bates -----	4 (Sup.)	174
<i>Feltia annexa</i> Treit. -----	3	101
<i>Feltia lucens</i> Walk. -----	2	25
	5	219-220
<i>Feltia malefida</i> Guen. -----	4	147
	6	305
<i>Feltia</i> sp. -----	6	305
<i>Feltia subgothica</i> Haw. -----	3	66
<i>Fidia viticida</i> Walsh -----	6	293
<i>Fiorinia fioriniae</i> Targ. -----	4 (Sup.)	196
<i>Fiorinia theae</i> Green -----	3	94
<i>Flatoides humeralis</i> Walk. -----	4 (Sup.)	199
<i>Forficula auricularia</i> L. -----	2	25
	6	275
	7	328, 339
	8	365, 391
<i>Formica pallide-fulva schaufussi</i> Mayr ---	4	161
Formicidae -----	1	23-24
	2	56-57
	3	100
	4	161
	5	270-271
	9	418
<i>Frankliniella cephalica</i> Gwfd. -----	2	50
	3	84
<i>Frankliniella fusca</i> Hinds -----	4	145
<i>Frankliniella tritici californica</i> Moul. --	5	237
<i>Freysuila ernettii</i> Schwarz -----	4 (Sup.)	187
<i>Galerucella cavicollis</i> Lec. -----	5	238
	6	274, 292
<i>Galerucella xanthomelaena</i> Schr. -----	2	49
	4	112, 152-153
	5	260-261
	6	274, 311
<i>Galeruca encaustica</i> Germ. -----	4 (Sup.)	169
<i>Gargaphia patricia</i> Stahl -----	4 (Sup.)	181
<i>Gastrophilus haemorrhoidalis</i> L. -----	7	362
<i>Gastrophilus intestinalis</i> DeG. -----	7	361
<i>Gastrophilus nasalis</i> L. -----	7	361-362
<i>Gastrophilus</i> spp. -----	6	320
Geometridae -----	2	23, 48
	3	90
	4	151
	5	259
	6	308-309
<i>Geraeus lentiginosus</i> Boh. -----	4 (Sup.)	177
<i>Glossonotus crataegi</i> Fitch -----	4	131
<i>Gnathocerus cornutus</i> Fab. -----	3	100

Gnorimoschema lycopersicella Busck -----	1	6,14
	2	27,43
	3	85
	6	296
	9	406-407
Gnorimoschema operculeella Zell. -----	5	253
Gonia longipalvilli Tothill -----	6	305
Goniurus proteus L. -----	9	407
Gossyparia spuria Mod. -----	1	18
	2	49
	4	153
	5	262
	6	312-313
	7	353
Graphocephala anceps Fowl. -----	4 (Sup.)	192
Graphocephala coccinea Forst. -----	4 (Sup.)	193
Graphocephala urbana Stahl -----	4 (Sup.)	193
Graphocephala versuta Say -----	4 (Sup.)	193
Grapholitha molesta Busck -----	2	37
	3	64,79
	4	134-135
	5	214,216,236
	6	274,290
	7	328
	8	365,372
	9	403
	10	449
Grapholitha packardi Zell. -----	7	339
	10	450
Graptolitha antennata Walk. -----	4	130
	5	233-234
	6	313
Gretchena bolliana Sling. -----	6	293
Gryllidae -----	9	418-419
Gryllus assimilis Fab. -----	6	317
	8	364
Gryllus domesticus L. -----	9	418-419
	10	462
Gryllus sp. -----	3	101
Gynaikothrips uzeli Zimm. -----	3	93
	4 (Sup.)	212
	9	417
Gymnetis liturata Oliv. -----	4 (Sup.)	174
Gypona scarlatina vimula Stahl -----	4 (Sup.)	193
Gypona vulnerata Walk. -----	4 (Sup.)	193-194
Haematobia irritans L. -----	3	97
	4	159
	6	320
	8	391
	9	420



<i>Haematopinus eurystermus</i> Nitz. -----	3	93
	4	159
<i>Helisilota underwoodi</i> Roth. -----	4 (Sup.)	207
<i>Haltica</i> sp. -----	4	144, 153
<i>Halticinae</i> -----	2	46
	3	34
	5	215
<i>Halticus citri</i> Ashm. -----	4 (Sup.)	131
	5	244
<i>Homadryas antiopa</i> L. -----	6	312
<i>Hormoloba fumiferana</i> Clem. -----	6	386
<i>Heliothis obsoleta</i> Fab. -----	3	63, 70-71, 74
	4	140, 147
	5	214, 245-246, 256
	6	273, 283-284
	7	326, 336, 349-350
	8	363, 376-377, 382-383
	9	395, 406
	10	453
<i>Heliothis virescens</i> Fab. -----	4	145
	5	253
<i>Heliothrips fasciatus</i> Perg. -----	6	408
<i>Hellula unialis</i> Fab. -----	4	142
	5	376
	9	406
<i>Hemerocampa costaricensis</i> Schaus -----	4 (Sup.)	207
<i>Hemerocampa leucostigma</i> S. & A. -----	6	365
<i>Hemichionaspis aspidistreae</i> Sign. -----	6	315
<i>Hemileuca lucina</i> W. Edwards -----	6	317
<i>Hermetia illucens</i> L. -----	8	391
<i>Herminodes porrecta</i> Walk. -----	4 (Sup.)	207
<i>Herse cingulata</i> Fab. -----	9	406
<i>Heteroderes laurentii</i> Guer. -----	2	31
<i>Heteronotus nodosus</i> Germ. -----	4 (Sup.)	202
<i>Hippelates</i> spp. -----	4	158
	7	361
<i>Hippodamia convergens</i> Guer. -----	1	9
	3	73
	5	257
	9	414
<i>Hippodamia quinquesignata obliqua</i> Csy. --	1	9
	3	73
<i>Hippodamia sinuata spuria</i> Lec. -----	1	9
	3	73
<i>Holcocomiceryacella</i> Riley -----	2	40
<i>Homaledra sabalella</i> Chamb. -----	8	392
<i>Homophoeta cyanipennis octomaculata</i> Grotch	4 (Sup.)	169
<i>Hoplia argyrites</i> Bates -----	4 (Sup.)	174
<i>Hoplia callipyge</i> Lec. -----	4	157
<i>Hoplia surata</i> Bates -----	4 (Sup.)	174
<i>Hoplocampa cooki</i> Clarke -----	3	81
<i>Horiola picta</i> Coque. -----	1 (Sup.)	203

<i>Horistonotus uhlerii</i> Horn -----	4	120
<i>Hylemyia antiqua</i> Meig. -----	5	214, 251
	6	302
<i>Hylemyia brassicae</i> Bouche -----	5	214, 249
	6	300
<i>Hylemyia cilicrura</i> Rond. -----	1	6, 15
	2	41-42
	4	138-139
	5	214, 242
	10	443, 450
<i>Hylesia alinda</i> Druce -----	4 (Sup.)	207
<i>Hylobius pales</i> Boh. -----	8	386
<i>Hydurgopinus rufipes</i> Eich. -----	2	49
	5	261
<i>Hymenia fascialis</i> Cram. -----	1	17
<i>Hymenoptera</i> -----	4	123
<i>Hypera postica</i> Gyll. -----	2	33
	3	72
	4	111, 124
	5	213, 230
	6	273, 286
	7	325, 337
	9	401
	10	447
<i>Hypera punctata</i> Fab. -----	3	63, 71-72
	4	124-125
	5	230
	10	463
<i>Hypermallus villosus</i> Fab. -----	6	314
	9	414
<i>Hyphantria cunea</i> Drury -----	4	137
	5	239-240
	6	309
	7	329, 340
	8	364, 374, 384
	9	396, 412
<i>Hyphantria</i> spp. -----	8	383-384
<i>Hyphantria textor</i> Harr. -----	8	383
<i>Hyphypona colpodes</i> Wlsm. -----	4 (Sup.)	207
<i>Hypoderma lineatum</i> DeVill. -----	1	22
	2	54
	3	98
<i>Hypoderma</i> spp. -----	2	54
	3	98
<i>Hypsilonotus atratus</i> Dist. -----	4 (Sup.)	182
<i>Hypsipyla grandella</i> Zell. -----	4 (Sup.)	207
<i>Hypsoprora coronata</i> Fab. -----	4 (Sup.)	203
<i>Hysteroncúra setariac</i> Thos. -----	1	10
	4	136

<i>Icerya montserratensis</i> Riley & How. -----	1 (Sup.)	196
<i>Icerya purchasi</i> Mask. -----	2	39-40
	3	82, 102
	5	241
	6	317
	9	417
<i>Idiocerus albicans</i> Hbn. -----	10	463
<i>Idiocerus fulgidus</i> Fab. -----	10	463
<i>Illinoia pisi</i> Kalt. -----	1	5, 9
	2	27, 33, 43
	3	63, 72-73, 86-87
	4	111, 123-124
	5	214, 247-249
	6	299
	7	328
<i>Illinoia solanifolii</i> Ashm. -----	5	246
	6	297
<i>Inareolata punctoria</i> Roman. -----	9 (Sup.)	433-435, 437-438, 441
<i>Insara intermedia</i> Bruner -----	1 (Sup.)	210
<i>Ips calligraphus</i> Germ. -----	9	415
<i>Iridomyrmex humilis</i> Mayr -----	1	24
	2	56
<i>Ischnaspis longirostris</i> Sign. -----	4 (Sup.)	196
<i>Isia isabella</i> S. & A. -----	5	222
<i>Ithycerus noveboracensis</i> Forst. -----	5	235
<i>Jadera acola</i> Dallas -----	4 (Sup.)	182
<i>Jalysus mollitus</i> Dist. -----	4 (Sup.)	182
<i>Jalysus spinosus</i> Say -----	8	378
<i>Janus integer</i> Mort. -----	5	239
<i>Jocara claudalis</i> Mosch. -----	4 (Sup.)	207
<i>Jocara subcurvalis</i> Schaus -----	4 (Sup.)	203
<i>Kaliosysphinga ulmi</i> Sunb. -----	5	262
<i>Kalotermea simplicicornis</i> Bks. -----	1	12
<i>Kolla fasciata</i> Walk. -----	4 (Sup.)	194
<i>Kolla geometrica</i> Sign. -----	4 (Sup.)	194
<i>Lachnus tomentosus</i> Villers -----	9	415
<i>Laphygma exigua</i> Hbn. -----	3	85
	4	112, 149-150
	5	214, 255
	10	454-455
<i>Laphygma frugiperda</i> S. & A. -----	4 (Sup.)	201
	6	277
	7	325, 331
	8	367
	9	398
<i>Lasioderma serricorne</i> Fab. -----	1	25
<i>Lasius claviger</i> Roger -----	9	417
<i>Lasius interjectus</i> Mayr -----	2	56, 57



<i>Lasporresia caryana</i> Fitch -----	9	404
<i>Lasporresia coniferana</i> Ratz. -----	10	463
<i>Lasporresia pacardii</i> Zell. See <i>Grapholitha pacardii</i> .		
<i>Latroctus nactans</i> Fab. -----	1	22
	2	54
	3	96
	4	158
	5	268
	6	318
	7	326, 359-360
	8	366, 389-390
	9	396, 419
<i>Lecanium corni</i> Bouche -----	4	153-154
	5	262
<i>Lecanium quercifex</i> Fitch -----	3	92
<i>Lechniops</i> sp. -----	4 (Sup.)	177
<i>Leis</i> sp. -----	4	137
<i>Lema nigrovittata</i> Guer. -----	3	68
<i>Lepidosaphes beckii</i> Newm. -----	1	12
	3	82
	4 (Sup.)	196
<i>Lepidosaphes camelliae</i> Hoke -----	3	94
<i>Lepidosaphes chinensis</i> Chamb. -----	10	464
<i>Lepidosaphes halli</i> Green -----	10	462
<i>Lepidosaphes ulmi</i> L. -----	1	21
	2	50
	3	94
	8	388
<i>Leptinotarsa decemlineata</i> Say -----	2	42
	3	64, 84-85
	4	139
	5	244-245
	6	274, 296
	8	364
<i>Leptinotarsa undecimlineata</i> Stahl -----	4 (Sup.)	170
<i>Leptobrysa chiriquensis</i> Champ. -----	4 (Sup.)	182
<i>Leptocoris trivittatus</i> Say -----	1	24
	2	53
	3	96
	6	292
	9	402
<i>Leptoglossus phyllorvus</i> L. -----	3	85
	4	135
	5	237
	6	295
	9	400
<i>Leptoglossus stigma</i> Hbst. -----	4 (Sup.)	182
<i>Leptoglossus zonatus</i> Dallas -----	4 (Sup.)	182
<i>Leucaspis japonica</i> Oell. -----	3	92
<i>Leucoptera coffecella</i> Guer. & Perrottet --	4 (Sup.)	208
	8	392

<i>Ligyrrus gibbosus</i> DeG. -----	5	214,250
	6	295
	7	341
	8	375-376
<i>Limonijs infuscatus</i> Mots. -----	4	120
<i>Limonijs</i> sp. -----	4	119
<i>Linognathus vituli</i> L. -----	1	22
<i>Liothrips vanescholei</i> Friesener -----	2	52
<i>Liothrips zetekii</i> Hood -----	4 (Sup.)	212
<i>Liponyssus bacoti</i> Hirst. -----	4	153
<i>Lissorhoptrus simplex</i> Say -----	4	126
<i>Listroderes obliquus</i> Gyll. -----	1	6,13
	2	41
	3	64,83
	4	136
	5	363,375
	6	405
<i>Lithocolletis</i> sp. -----	3	386
<i>Lobometopon guatemalensis</i> Champ. -----	4 (Sup.)	175-176
<i>Longistigna caryae</i> Ham. -----	4	150
<i>Lopidea davisi</i> Knight -----	4	157
	5	267
<i>Loxostege similalis</i> Guen. -----	6	295
	7	337
<i>Loxostege sticticalis</i> L. -----	3	67
	4	116
	7	325
<i>Lucilia semicata</i> Meig. -----	6	321
<i>Lucilia sylviana</i> Meig. -----	6	321
<i>Luperodes davisi</i> Long -----	6	286
<i>Luperodes varicornis</i> Lec. -----	5	229
	6	266
<i>Lycophotia</i> sp. -----	2	29
<i>Lycophotia margaritosa saucia</i> Hbn. -----	2	29
	4	115
	5	220
	6	276
	7	331
<i>Lyctus</i> spp. -----	2	56
<i>Lydella stabulans</i> grisescens R. D. -----	9 (Sup.)	434,435-436,438-440,441
<i>Lygaeonematus erichsonii</i> Htg. -----	6	313
	7	326,353-354
<i>Lygaeus bistriangularis</i> Say -----	4 (Sup.)	183
<i>Lygaeus circumlitus</i> Stahl -----	4 (Sup.)	183
<i>Lygaeus reclinatus</i> Say -----	4 (Sup.)	183
<i>Lygus elisus</i> Van D. -----	6	266
<i>Lygus elisus hesperius</i> Knight -----	6	286
	10	456
<i>Lygus pratensis</i> L. -----	2	12
	6	295,306
	7	343
	8	372

<i>Ligus pnatensis</i> L. (Cont'd.)-----	9	405
	10	456
<i>Ligus</i> spp. -----	6	291
	9	412
<i>Lytta reticulata</i> Say -----	7	341
<i>Machimia erythema</i> Wlsm. -----	4 (Sup.)	203
<i>Macrobasis segmentata</i> Say -----	7	341
<i>Macrobasis unicolor</i> Kby. -----	4	156
	5	243
<i>Macroncentrus gifuensis</i> Ashm. -----	9 (Sup.)	436
<i>Macroductylus lineatus</i> Chevr. -----	4 (Sup.)	174
<i>Macroductylus suavis</i> Bates -----	4 (Sup.)	175
<i>Macroductylus subspinosus</i> Fab. -----	4	132
	5	224
	6	279
	7	328
<i>Macroductylus sylphis</i> Bates -----	4 (Sup.)	175
<i>Macronoctua onusta</i> Grote -----	6	316
	7	357
<i>Macropsis tiliae</i> Burm. -----	10	163
<i>Macrosiphum rosae</i> L. -----	3	95
	5	267
<i>Magdicicada septendecim</i> L. -----	1	5
	2 (Sup.)	59-61
	4	150
	10	456-457
<i>Malacosoma americana</i> Fab. -----	2	27, 34-35
	4	112, 128-129
	5	233
	10	449
<i>Malacosoma dissidia</i> Hbn. -----	2	48
	3	64, 75-76, 90
	4	150-151
	5	214, 258-259
	6	307-308
	10	460-461
<i>Malacosoma</i> sp. -----	5	216
<i>Margarodes</i> sp. -----	2	40
<i>Matsucoccus matsumurae</i> Kuw. -----	9	415
<i>Megachile concinna</i> Smith -----	8	393
<i>Megalopyge costaricensis</i> Sch. -----	4 (Sup.)	208
<i>Megalopyge opercularis</i> S. & A. -----	7	358
<i>Megalotomus femoratus</i> Dist. -----	4 (Sup.)	183
<i>Melanocallis caryaefoliae</i> Davis -----	5	240
<i>Melanophila fulvoguttata</i> Harr. -----	3	91
	4	154
<i>Melanoplus angustipennis</i> Dodge -----	8	367
<i>Melanoplus atlantis</i> Riley. See <i>M. mexicanus</i> Sauss.		



Melanoplus bivittatus Say -----	4	113
	5	215, 218
	6	275
	7	327, 330
	8	367
	10	445
Melanoplus differentialis Thos. -----	6	275
	7	330
	8	367
	9	397
	10	445
Melanoplus femur-rubrum DeG. -----	5	217, 218
	7	330
	8	367
	9	397
	10	445
Melanoplus mexicanus Sauss. -----	2	29
	3	63, 65
	4	113
	5	215, 217
	6	275
	7	330
	8	367
	9	397
	10	445
Melanoplus packardii Scudd. -----	10	445
Melanotus pilosus Blatch. -----	6	273
Melanotus sp. -----	4	120
	5	224, 225
Meloidae -----	5	214, 243
	7	325, 327, 341
	8	375
Membracis mexicana Guer. -----	4 (Sup.)	203
Merodon equestris Fab. -----	2	52
Meromyza americana Fitch -----	6	261
	7	335
	8	364, 368
Mesocondyla concordalis Hbn. -----	4 (Sup.)	208
Meteorus nigricolis Thoms. -----	9 (Sup.)	436
Meteorus versicolor Wesm. -----	10	460
Metriana bivittata Say -----	5	251
Metriana emarginata Boh. -----	5 (Sup.)	170
Microbracon brevicornis Wesm. -----	9 (Sup.)	436
Microgaster tibialis Nees. -----	9 (Sup.)	436
Microctalis albivitta Fowl. -----	4 (Sup.)	203
Mimlarus abietinus Koch -----	5	262
Monarthropalpus buxi Labou. -----	6	315
Monocophora bicincta Say -----	4 (Sup.)	187
Monocophora postica Wall. -----	4 (Sup.)	187
Monellia costalis Fitch -----	6	294
Monellia nigropunctata Granovsky -----	6	294

<i>Monocesta coryli</i> Say -----	9	416
<i>Monochamus notatus</i> Drury -----	4	161
<i>Monocrepidius</i> sp. -----	6	278
<i>Monomorium minimum</i> Buckl. -----	4	161
<i>Monomorium pharaonis</i> L. -----	1	24
	2	57
	4	161
<i>Monoptilota pengratialis</i> Hulst -----	5	247
<i>Mormidea notulata</i> H. & S. -----	4 (Sup.)	183
<i>Murgantia histrionica</i> Hahn -----	2	45
	3	88
	4	143
	5	249
	7	344
	8	380
	9	408
<i>Mycotretus luteipes</i> Lac. -----	4 (Sup.)	173
<i>Myllocerus blandis</i> Boh. -----	6	278
<i>Myllocerus castaneus</i> Roelofs -----	6	273, 278
	10	458
<i>Myzocallis kahaweluohalani</i> Kirk. -----	6	316
	9	417
<i>Myzus cerasi</i> Fab. -----	3	80
	5	238
	7	328
<i>Myzus circumflexus</i> Buckton -----	2	52
<i>Myzus persicae</i> Sulz. -----	1	14
	2	45
	3	85
	4	135
	6	297
	9	410
<i>Myzus ribis</i> L. -----	4	136
	5	239
	6	293
<i>Nabis ferus</i> L. -----	5	248
<i>Necorda melanura</i> L. -----	8	366
<i>Nemorilla florales</i> Fall. -----	9 (Sup.)	436
<i>Neoborus</i> sp. -----	5	260
<i>Neoclytus caprea</i> Say -----	3	90
<i>Neodiprion dyari</i> Rohw. -----	5	265
<i>Neodiprion polytorum</i> Htg. -----	5	265
	7	326, 329, 355
	8	365, 387
	9	416
<i>Neodiprion tsugae</i> Middleton -----	4	153-154
<i>Neolecanium cornuparvum</i> Thro -----	5	267
	6	316
	7	357
	8	388

Neolygus caryae Knight -----	8	372
Neolygus invitus Say -----	8	372
Neolygus quercalba Knight -----	8	372
Neophasia menapia Feld. -----	8	386
Neomabea bipunctata DeG. -----	4 (Sup.)	210
Nesrus flavatus Navas -----	4 (Sup.)	211
Neuroterus irregularis O. S. -----	5	261
Neuroterus majalis Bass. -----	6	314
Nezara viridula L. -----	4 (Sup.)	183
	5	244
	9	395, 405-406
Nicentrus lineicollis Boh. -----	4 (Sup.)	177
Noctuidae -----	2	27, 29-30
	3	63, 65-66
	4	111, 114-115, 147
	5	213, 215, 219-220, 256
	6	305
	7	325, 327
	10	443, 447-448
Nodonota irazuensis Jacoby -----	4 (Sup.)	170-171
Nodonota lateralis Jacoby -----	4 (Sup.)	171-172
Nodonota puncticollis Say -----	5	237
Nygma phaeorrhoea Don. -----	3	90
	10	459
Nysius ericae Schill. -----	5	243
	7	351
	8	376
	9	405
Nysius sp. -----	6	303
Oberea bimaculata Oliv. -----	8	373
Oberea myops Hald. -----	6	292
Ochrosidia immaculata Oliv. -----	4	119
Ochrosidia reflexa Csy. -----	7	332
Oedaleonotus enigma Scudd. -----	4	113
Oedionychis tenuicincta Jacoby -----	4 (Sup.)	172
Oestris ovis L. -----	4	160
	6	320
Oncideres cingulata Say -----	9	404
Oncometopia undata Fab. -----	4 (Sup.)	194
Oncopeltus cingulifer Stahl -----	4 (Sup.)	183
Oncopeltus fasciatus Dallas -----	4 (Sup.)	184
Oniscidae -----	3	88
Onychiurus sp. -----	5	244
Orchestes pallicornis Say -----	4	132
	5	235
	6	289
Oreodera costaricensis Thom. -----	4 (Sup.)	165
Ormenis septrionalis Spin. -----	5	267
Ornithodoros coriaceus Koch -----	5	268
	9	419



Ornithodoros megnini Duges -----	3	98
	8	391
Orthaea bilobata Say -----	1	17
Orthezia insignis Dougl. -----	4 (Sup.)	197
Orthonama obstipata Fab. -----	9	409
Oryzophilus surinamensis L. -----	3	101
Pachnaeus litus Germ. -----	3	82
Pachybrachys femoratus Oliv. -----	4 (Sup.)	172
Pachycoris torridus Scop. -----	4 (Sup.)	184
Pachynomatus ocreatus Harr. -----	7	329
Pachystethus marginata Fab. -----	6	294
Pachystethus micans Burm. -----	4 (Sup.)	175
Pachystethus nitidula Blanch. -----	4 (Sup.)	175
Pachystethus olivia Horn -----	8	364, 386
Pachyzancla periusalis Walk. -----	9	395, 407
Paederus laetus Erichs. -----	4 (Sup.)	175
Paleacrita vernata Peck -----	1	6, 18
	2	28, 48
	5	259
	6	308
	10	460
Panchlora cubensis Sauss. -----	4 (Sup.)	210
Pandelestus erubescens Champ. -----	4 (Sup.)	177
Papaipema nebris nitela Guen. -----	6	284
	7	337
Papilio anchisiades idaeus Fab. -----	4 (Sup.)	208
Papilio cresphontes Cram. -----	9	399
Papilio glaucus turnus L. -----	9	399
Papilio polyxenes stabilis R. & J. -----	4 (Sup.)	209
Papilio thoas autocles Roth. -----	4 (Sup.)	209
Paracalocoris annulatus Dist. -----	4 (Sup.)	184
Paralechia pinifoliella Chamb. -----	5	265
Paranabrus scabricollis Thos. -----	10	445
Parastichtis purpurea Grote -----	2	30
Paratetranychus citri McG. -----	2	40
Paratetranychus pilosus C. & F. -----	2	37
	3	78
	5	216
Paratettix mexicanus abortus Hancock -----	4 (Sup.)	210
Paratrechina longicornis Latr. -----	8	392
Paratrioza cockerelli Sulc. -----	2	43
	8	378
Pardalophora haldemani Scudd. -----	6	275
Parlatoria oleae Colv. -----	3	95
Parlatoria pergandii Comst. -----	2	40
Pectinophora gossypiella Saund. -----	3	102
	4	149
	5	256
	6	305-306
	7	350

Pectinophora gossypiella Saund. (Cont'd.) -	8	383
	9	411
	10	452-453
Pediopsis tiliae Burm. -----	10	463
Pelidnota punctata L. -----	7	332
Pomphigus populi-transversus Riley -----	7	354-355
Pomphredon lethifer Shuckard -----	10	401
Pontatomidae -----	9	412
Periclista sp. -----	4	137
Periclista hicoriae Rohw. -----	4	137
Periphyllus lyropictus Kess. -----	5	264
	6	313
Periphyllus nebulosus Thos. -----	4	152
	6	313
Periplaneta australasiae Fab. -----	4 (Sup.)	211
Perithous divinator Rossi -----	10	464
Peronea varians Fern. -----	6	365
Petrobia tritici Ewing -----	3	37
Phaea lateralis Bates -----	4 (Sup.)	165
Phaenogenes nigridens Wesm. -----	9 (Sup.)	436
Phaenidole desertorum comanche Whlr. -----	1	21
Phaenidole megacephala Fab. -----	3	393
Phaenidole sp. -----	3	100
Phaletes californicus Mann. -----	1	7
	2	31
	3	69
Phaletes canus Lec. -----	1	7
	2	31
	3	68
	4	120
	6	273
Phigalia titea Cram. -----	4	90
Philometus leucophthalmus L. -----	3	241
Philonthus feralis Erichs. -----	4 (Sup.)	175
Philegethontius quinquemaculata Haw. -----	7	311
Philegethontius sexta Johan -----	4	145
	5	253
	7	342
	8	377
Philegethontius spp. -----	6	296-297, 301
	7	342
Phlyctaenia rubigalis Guen. -----	1	16
	2	46
Phobetrus hipparchiae Cr. -----	4 (Sup.)	209
Phobetus comatus Lec. -----	5	230
Pholus achemon Drury -----	4	117
Phormia regina Meig. -----	2	55
	5	269, 270
Phorocera erecta Coq. -----	7 (Sup.)	436
Phthialunata Fab. -----	7 (Sup.)	134
Phthia picta Drury -----	7	343
Phyllaphis fagi L. -----	5	260

<i>Phyllobius oblongus</i> L. -----	5	258
	6	307
	10	457
<i>Phyllocoptes oleivorus</i> Ashm. -----	1	12-13
	3	82
	5	241
<i>Phyllocoptes quadripes</i> Shim. -----	5	264
<i>Phyllophaga anxia</i> Lec. -----	5	223
<i>Phyllophaga balia</i> Say -----	5	223
<i>Phyllophaga bipartita</i> Horn -----	3	68
<i>Phyllophaga calceata</i> Lec. -----	2	30
	3	67-68
<i>Phyllophaga congrua</i> Lec. -----	2	30
	3	68
<i>Phyllophaga crassissima</i> Blanch. -----	3	68
	4	119
<i>Phyllophaga crenulata</i> Froel. -----	3	68
	4	119
<i>Phyllophaga drakei</i> Kby. -----	5	223
<i>Phyllophaga fervida</i> Fab. -----	4	118, 119
<i>Phyllophaga fosteri</i> Burn. -----	4	118
<i>Phyllophaga fraterna</i> Harr. -----	4	118, 119
<i>Phyllophaga fraterna mississippiensis</i> Davis -----	3	68
<i>Phyllophaga fusca</i> Froel. -----	4	118-119
	5	223
	7	332
<i>Phyllophaga futilis</i> Lec. -----	2	30
	4	119
	5	223
<i>Phyllophaga hirticula</i> Knoch -----	4	119
	5	223
<i>Phyllophaga hirtiventris</i> Horn -----	4	119
<i>Phyllophaga horni</i> Smith -----	4	119
<i>Phyllophaga ilicis</i> Knoch -----	5	223
<i>Phyllophaga implicita</i> Horn -----	5	223
<i>Phyllophaga luctuosa</i> Horn -----	4	118
<i>Phyllophaga micans</i> Knoch -----	4	118
<i>Phyllophaga rubiginosa</i> Lec. -----	4	119
<i>Phyllophaga rugosa</i> Melsh. -----	4	119
	5	223
<i>Phyllophaga</i> spp. -----	1	5
	2	27, 30
	3	63, 67-68
	4	111, 118-119
	5	215, 222-223
	7	327
	9	398-399
<i>Phyllophaga tristis</i> Fab. -----	3	68
	4	118, 119
	5	223
<i>Phyllophaga ullrei</i> Smith -----	4	118
<i>Phyllophaga vehemens</i> Horn -----	4	119
<i>Phyllotreta armoraciae</i> Koch -----	4	143



Phyllotreta vittata Fab. -----	2	46
	3	375
Phylloxera devastatrix Perg. -----	4	137
	5	240
Phylloxera notabilis Perg. -----	5	240
Phylloxera sp. -----	3	91
Physokermes piceae Schr. -----	5	314
Physostegania pustalaria Guen. -----	7	354
Phytomyza ilicis Curt. -----	2	51
	3	95
Phytophaga destructor Say -----	2	31-32
	3	63, 69
	4	111, 121
	5	213, 226-227
	6	281
	6 (Sup.)	323-324
	7	325, 334
	8	363, 368
	9	395, 399
	10	446-447
Pieris monusta L. -----	4	118
Pineus strobi Htg. -----	4	155
	5	265
Pissodes deodarae Hopk. -----	1	20
	2	51
	3	94
	7	356
	8	387
	9	417
Plagiodera versicolora Laich. -----	4	155
	5	266
	6	314
	7	355
Plathypena scabra Fab. -----	3	369
Platypsylla castoris Reitsema -----	4	159
Plodia interpunctella Hbn. -----	1	24-25
Plutella maculipennis Curt. -----	1	6, 15-16
	2	44
	3	87-88
	4	142
	4 (Sup.)	209
	5	249-250
	8	379
Poecillocapsus frumentarius Dist. -----	1 (Sup.)	184
Poecillocapsus lineatus Fab. -----	5	239
	6	315
Polia renigera Steph. -----	2	29
Polychrosis rhoifrutana Kearf. -----	9	418
Polychrosis viteana Clem. -----	5	239
	8	374
Polyglypta dispar Fowl. -----	4 (Sup.)	203
Polyglyptodes cucullatus Fowl. -----	4 (Sup.)	204
Polymerus cuneatus Dist. -----	4 (Sup.)	184

<i>Pomphopoea sayi</i> Lec. -----	4	132
<i>Popillia japonica</i> Newm. -----	5	213,223-224
	6	273,273-275
	7	332-333
	10	456
<i>Poppea capricornis</i> Fowl. -----	4 (Sup.)	204
<i>Porosagrotis orthogonia</i> Morr. -----	4	115
	5	215,220
	7	327
<i>Porthetria dispar</i> L. -----	1	6,18
	4	112,151
	5	260
	6	309
	9	412-413
	10	459
<i>Pronolepis parvula</i> Mayr -----	2	57
<i>Prionodera wagneri</i> Harold -----	4 (Sup.)	172
<i>Prionomerus calceatus</i> Say -----	5	266
<i>Prionoxystus macmurtrei</i> Guer. -----	6	314
<i>Prionus</i> sp. -----	9	413
<i>Pristiphora banksi</i> Marl. -----	6	313
<i>Pristiphora geniculata</i> Htg. -----	10	464
<i>Prociophilus tessellatus</i> Fitch -----	5	264
<i>Prodenia ornithogalli</i> Guen. -----	4	147
	5	220
	7	331
<i>Prodenia praefica</i> Grote -----	6	276
<i>Prodenia</i> sp. -----	4	147
	5	256
	6	305
	8	393
<i>Proleucoptera albella</i> Chamb. -----	9	396,416
<i>Protoparce punctulatus</i> Bdv. -----	4 (Sup.)	184
<i>Psallus seriatus</i> Reut. -----	4	112,148-149
	5	257
	6	306
	7	326,350-351
	8	383
	10	455-456
<i>Psephischnaspis bowreyi</i> Chll. -----	4 (Sup.)	197
<i>Pseudococcus bonensis</i> Kuw. -----	1	10
<i>Pseudococcus citri</i> Risso -----	4 (Sup.)	197
	9	417
<i>Pseudococcus comstocki</i> Kuw. -----	8	385
<i>Pseudococcus nipae</i> Mask. -----	4 (Sup.)	197
<i>Pseudococcus virgatus</i> Chll. -----	4 (Sup.)	197
<i>Psila rosae</i> Frib. -----	6	302
<i>Psimidia fenestralis</i> Serv. -----	8	367
<i>Psocus</i> sp. -----	4	162
<i>Psorophora columbiae</i> D. & K. -----	9	421
<i>Psorophora</i> sp. -----	8	393
<i>Psyllia buxi</i> L. -----	6	316

<i>Psyllia mali</i> Schmid. -----	5	216
<i>Psyllia pyricola</i> Foerst. -----	3	80
	4	135
	5	237
	6	291
<i>Pterygia bituberculata</i> Fowl. -----	4 (Sup.)	204
<i>Eulex irritans</i> L. -----	3	389
	9	418
<i>Pulvinaria psidii</i> Mask. -----	4 (Sup.)	197
<i>Pulvinaria vitis</i> L. -----	6	310
<i>Pynoderes incurvus</i> Dist. -----	4 (Sup.)	184
<i>Pynoderes quadrimaculatus</i> Guer. -----	8	376
<i>Pyniopalpa bicordata</i> Serv. -----	4 (Sup.)	211
<i>Pyralis farinalis</i> L. -----	6	321
<i>Pyrausta nubilalis</i> Hbn. -----	2	32
	5	213, 228
	6	234-285
	7	337
	8	369
	9 (Sup.)	433-441
	10	447
<i>Recurvaria milleri</i> Busch -----	1	20
<i>Recurvaria piceaella</i> Kearf. -----	5	265
<i>Reticulitermes flavipes</i> Kol. -----	2	55
	3	99
	4	160
	5	270
	6	321
<i>Reticulitermes</i> spp. -----	1	23
	2	55-56
	3	61, 99-100
	4	160-161
	5	270
	6	321
	8	391
	9	421
<i>Reticulitermes tibialis</i> Bks. -----	1	23
	2	56
	3	100
	4	161
	5	270
	8	391
<i>Rhagoletis cingulata</i> Loew -----	5	238
	6	292
	7	339-340
<i>Rhagoletis fausta</i> O. S. -----	5	238
<i>Rhagoletis pomonella</i> Walsh -----	5	234
	6	273, 283-299
	7	340
	9	395, 402



<i>Rhipipteryx biolleyi</i> Sausa. -----	4 (Sup.)	211
<i>Rhizoglyphus hyacinthi</i> Bdv. -----	2	52
	4	158
	6	316
<i>Rhodites bicolor</i> Harr. -----	5	267
<i>Rhodobaenus bicinctus</i> Chevr. -----	4 (Sup.)	177
<i>Rhodobaenus pantherinus</i> Champ. -----	4 (Sup.)	177
<i>Rhodobaenus tredecimpunctatus</i> Ill. -----	7	326, 356
<i>Rhopalosiphoninus tulipella</i> Theob. -----	4	157-158
<i>Rhopalosiphum berberidis</i> Kalt. -----	4	156
<i>Rhopalosiphum nymphaeae</i> L. -----	9	413
<i>Rhopalosiphum prunifoliae</i> Fitch -----	2	32, 35
	3	76, 77
	4	130-131
	9	399
<i>Rhopalosiphum pseudobrassicae</i> Davis -----	1	14
	2	45
	4 (Sup.)	186
	6	376
	9	409
<i>Rhopalosiphum</i> sp. -----	4	148
	5	257
	10	455
<i>Rhyacionia buoliana</i> Schiff. -----	3	92
	5	264
<i>Rhyacionia frustrana</i> Comst. -----	6	314
<i>Rhyacionia frustrana bushnelli</i> Busck ---	6	314
<i>Rhynchagrotis alternata</i> Grote -----	5	219
<i>Rhynchites bicolor</i> Fab. -----	5	267
<i>Rhynchosciara brevicornis</i> Guer. -----	4 (Sup.)	178
<i>Rodolia cardinalis</i> Muls. -----	2	40
	3	82, 102
	5	241
	6	317
<i>Rogas unicolor</i> Wesm. -----	10	460
<i>Saissetia hemisphaerica</i> Targ. -----	4 (Sup.)	197-198
	8	393
<i>Saissetia nigra</i> Nietn. -----	4 (Sup.)	198
<i>Saissetia oleae</i> Bern. -----	4 (Sup.)	198
<i>Saperda candida</i> Fab. -----	2	37
<i>Saperda tridentata</i> Oliv. -----	2	49
	3	91
	4	153
<i>Sarcoptes scabiei</i> suis DeG. -----	1	23
<i>Scapteriscus acletus</i> R. & H. -----	4	138
	8	376
<i>Scapteriscus vicinus</i> Scudd. -----	2	42
	4	112, 138
	8	376
	9	406

Schistocerca alutacea Harr. -----	3	367
Schistocerca americana Drury -----	2	29
	3	65
Schistocerca impleta Walk. -----	4 (Sup.)	211
Schistocerca paranensis Burm. -----	4	114
Schizolachnus tomentosus. See Lachnus tomentosus Villers.		
Schoenicus panamensis Champ. -----	4 (Sup.)	176
Scobicia declivis Lec. -----	5	271
Scolytus multistriatus Marsh. -----	2	49
	4	152
	5	261
	8	385
	10.	458-459
Scolytus rugulosus Ratz. -----	1	13
	9	403
Scolytus scolytus Fab. -----	10	459
Scotogramma trifolii Rott. -----	3	66
	4	115
Scutigerella immaculata Newp. -----	2	42
	5	244
Selenaspidus articulatus Morg. -----	4 (Sup.)	198
Selenothrips rubrocinctus Giard -----	4 (Sup.)	212
Septis alia Guen. -----	4	130
Serica fimbriata Lec. -----	4	157
Sibine apicalis Dyar -----	4 (Sup.)	209
Sibine stimulea Clem. -----	7	326, 358
Simulium. See Eusimulium.		
Sitophilus oryzae L. -----	1	25
	3	392
	9	422
Solenopsis geminata Fab. -----	4 (Sup.)	205
	8	393
Solenopsis molesta Say -----	5	271
Solenopsis saevissima richteri Forel. -----	1	23-24
	4	161
Solenopsis xyloni McCook -----	1	24
	2	56
	3	100
	4	161
	5	270
Solubea pugnax Fab. -----	4	126
Spaniotoma sp. -----	3	93
Spaniotoma stercoreacea DeG. -----	3	93
Spharagemon collare Scudd. -----	8	367
Sphinx lineata Fab. -----	4	111, 116-117
Sphilonota ocellana Schiff. -----	5	216
Spongophorus ballista Germ. -----	4 (Sup.)	204
Steirarrhinus nebulosis Champ. -----	4 (Sup.)	177
Stenoma anomella Sepp. -----	4 (Sup.)	209
Stenoma sororia Zell. -----	4 (Sup.)	209
Stenomacra marginella H. & S. -----	4 (Sup.)	185
Stephanitis pyrioides Scott -----	7	356
Sterictiphora cellularis Say -----	6	302

<i>Stictoccephala festina</i> Say -----	4 (Sup.)	204
	5	246
<i>Stilpnocia salicis</i> L. -----	5	216, 259
	6	274, 308
	7	329, 352
	10	460
<i>Stiretrus anchorago</i> Fab. -----	4	139
<i>Stomococcus platani</i> Ferris -----	4	155
<i>Stenomys calcitrans</i> L. -----	3	98
	6	319-320
	7	361
	9	420
<i>Strategus quadrifoveatus</i> Edv. -----	3	392
<i>Strigoderma arboricola</i> Fab. -----	6	298
<i>Strigoderma rutelina</i> Bates -----	4 (Sup.)	175
<i>Strymon melinus</i> Hbn. -----	7	350
<i>Susuma cupressi</i> Rohw. -----	4	152
<i>Systema taeniata</i> Say -----	4	142
<i>Systema taeniata blanda</i> Melsh. -----	5	252
<i>Syrphidae</i> -----	4	123
<i>Tabanus atratus</i> Fab. -----	9	421
<i>Tabanus daeckrei</i> Hine -----	5	269
<i>Tabanus equalis</i> Hine -----	5	269
<i>Tabanus erythraeus</i> Hine -----	5	269
<i>Tabanus lineola</i> Fab. -----	7	361
<i>Tabanus</i> spp. -----	5	269
	7	361
<i>Taenioptera varipennis</i> Rehn -----	4 (Sup.)	211
<i>Taeniopteryx pacifica</i> Bls. -----	4	151
<i>Taeniothrips gladioli</i> M. & S. -----	1	21
	3	94
	4	156
	6	316
	7	357
	8	365, 388
<i>Taeniothrips inconsequens</i> Uzel -----	2	38
	3	64, 80
	4	135-156
<i>Tarbinora sessile</i> Say -----	2	57
<i>Tarsonemus bancrofti</i> Michael -----	2	53
	10	464
<i>Tarsonemus pallidus</i> Bls. -----	4	156
<i>Tegonicula</i> sp. -----	3	95
<i>Tenodera sinensis</i> Sauss. -----	7	356
<i>Tentredinidae</i> -----	4	152
<i>Tetanops aldrichi</i> Hendel -----	7	328
<i>Tetraeuresta obscuriventris</i> Loew -----	4 (Sup.)	179
<i>Tetramorium caespitum</i> L. -----	2	56
<i>Tetranychus pacificus</i> McG. -----	9	401
<i>Tetranychus</i> spp. -----	1	13
<i>Tetranychus telarius</i> L. -----	1	6, 13, 17, 20
	2	47, 51



Tetranychus telarius L. (Cont'd.) -----	3	72
	6	273,280-281,307
	7	325,333-334,351
	8	373
Thrips tabaci Lind. -----	2	27-28, 46
	3	84,101-102
	4	143
	7	345-346
	9	409
Thyanta brevis Van D. -----	9	395
Thyanta custator Fab. -----	6	291
	10	456
Thyanta perditor Fab. -----	4 (Sup.)	135
Thyreocoris sp. -----	4	144
Thyridopteryx ephemeraeformis Haw. -----	2	49
	5	214,260
	6	274,309-310
	7	326,352
	8	334
	9	413
	10	461
Thysanoptera -----	4	146
Tineola uterella Wlsm. -----	4 (Sup.)	209
Tingitidae -----	3	94
Tipulidae -----	1	7
Textrix citrana Fern. -----	2	40
	5	240
Toumeyella liriodendri Gmel. -----	3	93
	8	387
Toumeyella numismaticum Pettit & McDaniel	3	93
	4	155
Toxoptera aurantiae Boyer -----	4 (Sup.)	186
Toxoptera graminum Rond. -----	1	5,8
	2	27,32
	3	63,70
	4	123
Toxotrypana curvicauda Gerst. -----	1	12
	3	33
	4 (Sup.)	179
	10	449
Tracholus tabidus Fab. -----	4	123
	5	227
	6	281
	7	334-335
Tremex columba L. -----	9	413
Triatoma sanguisuga Lec. -----	7	358
Trichiotinus bibens Fab. -----	6	289
Trichiotinus piger Fab. -----	6	317
Trichobryis trinotata Say -----	5	253
Trichogramma minutum Riley -----	3	74
Trichogramma sp. -----	8	370

Trichopoda pennipes Fab. -----	5	244
Trifilaphis phaseoli Pass. -----	4	148
	5	257
	10	455
Trigona amalthea Oliv. -----	4 (Sup.)	205
Trigona cupira Smith -----	4 (Sup.)	205
Trigona ruficrus corvina Cr. -----	4 (Sup.)	205
Trigonogenius globulum Solier -----	4	162
Trichymus sacchari Coll. -----	4 (Sup.)	198
Trogoderma tarsalis Melsh. -----	3	101
Trombicula irritans Riley -----	6	318
	8	389
Tuberculatus ulmifolii Monell -----	5	261
	8	385
Tylonotus binaculatus Hald. -----	9	413
Typhlocyba pomaria McAtee -----	4	131
	5	234
	7	338
Typophorus viridicyaneus Crotch -----	5	251
Umbonia crassicornis Am. & Serv. -----	4 (Sup.)	204
Utetheisa bella L. -----	8	370
Vanduzee segmentata Fowl. -----	4 (Sup.)	204
Vitula serratilineella Rag. -----	1	24
Xenopsylla cheopsis Rothsch. -----	2	53
Zenillia mitis Meig. -----	9 (Sup.)	436
Zenillia roseanae B.B. -----	9 (Sup.)	436
Zeugophora scutellaris Suffr. -----	9	416

We wish to urge our collaborators to use the common names accepted by the American Association of Economic Entomologists. They are indicated by the letters a.n.o. (americano nomina officinale). A complete list of accepted names will be published in the Journal of Economic Entomology in the fall of 1936.

Alfalfa looper a.n.o. -----	Autographa californica Speyer
Alfalfa weevil a.n.o. -----	Hypera postica Gyll.
American dog tick a.n.o. -----	Dermacentor variabilis Say
Apple aphid a.n.o. -----	Aphis pomi DeG.
Apple flea weevil a.n.o. -----	Orchestes pallicornis Say
Apple grain aphid a.n.o. -----	Rhopalosiphum prunifoliae Fitch
Apple maggot a.n.o. -----	Rhagoletis pomonella Walsh
Apple sucker a.n.o. -----	Psyllia mali Schmid.
Arborvitae aphid -----	Dilachnus thujaefilina Del Guer.
Argentine ant a.n.o. -----	Iridomyrmex humilis Mayr
Army cutworm a.n.o. -----	Chorizagrotis auxiliaris Grote
Armyworm a.n.o. -----	Cirphis unipuncta Haw.
Ash-gray blister beetle a.n.o. -----	Macrobasis unicolor Kby.
Asiatic garden beetle -----	Autoserica castanea Arrow
Azalea lacebug -----	Stephanitis pyrioides Scott
Bagworm a.n.o. -----	Thyridopteryx ephemeraeformis Haw.
Balsam twig aphid a.n.o. -----	Kindarus abietinus Koch
Balsam woolly aphid -----	Dreyfusia piceae Ratz.
Bamboo scale -----	Asterolecanium bambusae Bdv.
Banded ash borer -----	Neoclytus caprea Say
Banded cucumber beetle a.n.o. -----	Diabrotica balteata Lec.
Banded flea beetle a.n.o. -----	Systema taeniata Say
Barberry aphid -----	Rhopalosiphum berberidis Kalt.
Bean leaf beetle a.n.o. -----	Cerotoma trifurcata Forst.
Bean leaf roller a.n.o. -----	Goniurus proteus L.
Bean thrips a.n.o. -----	Heliothrips fasciatus Perg.
Bean weevil a.n.o. -----	Acanthoscelides obtectus Say
Beaver parasite -----	Platypsylla castoris Reitsema
Bedbug a.n.o. -----	Cimex lectularius L.
Beech scale a.n.o. -----	Cryptococcus fagi Baer.
Beet armyworm a.n.o. -----	Lophygma exigua Hbn.
Beet leafhopper a.n.o. -----	Eutettix tenellus Bal.
Beet webworm a.n.o. -----	Loxostege sticticalis L.
Bella moth -----	Utetheisa bella L.
Bertha armyworm a.n.o. -----	Barathra configurata Walk.
Black blister beetle a.n.o. -----	Epicauta pennsylvanica DeG.
Black carpet beetle a.n.o. -----	Attagenus piceus Oliv.
Black cherry aphid a.n.o. -----	Myzus cerasi Fab.
Black grain-stem sawfly -----	Trachelus tabidus Fab.
Black-headed budworm -----	Peronca varians Fern.
Black horse fly a.n.o. -----	Tabanus atratus Fab.
Black peach aphid a.n.o. -----	Amuraphis persicae-niger Smith
Black pecan aphid a.n.o. -----	Melanocallis caryaefoliae Davis
Black vine weevil a.n.o. -----	Brachyrhinus sulcatus Fab.
Black widow spider -----	Latrodectus mactans Fab.



Blood-sucking conenose a.n.o. -----	Triatoma sanguisuga Lec.
Blueberry maggot a.n.o. -----	Rhagoletis pomonella Walsh
Blueberry stem borer -----	Oberea myops Hald.
Blunt-nosed leafhopper -----	Euscelis striatulus Fall.
Boll weevil a.n.o. -----	Anthonomus grandis Boh.
Boll worm a.n.o. -----	Heliothis obsoleta Fab.
Boxelder aphid a.n.o. -----	Periphyllus negundinis Thos.
Boxelder bug a.n.o. -----	Leptocoris trivittatus Say
Boxwood leaf miner a.n.o. -----	Monarthropalpus buxi Labou.
Boxwood psyllid a.n.o. -----	Psyllia buxi L.
Broad-horned flour beetle -----	Gnathocerus cornutus Fab.
Bronze birch borer a.n.o. -----	Agrilus anxius Gory
Brown-tail moth a.n.o. -----	Nygmia phaeorrhoa Don.
Brown winter tick a.n.o. -----	Dermacentor nigrolineatus Pack.
Bulb mite a.n.o. -----	Rhizoglyphus hyacinthi Bdv.
Cabbage aphid a.n.o. -----	Brevicoryne brassicae L.
Cabbage looper a.n.o. -----	Autographa brassicae Riley
Cabbage maggot a.n.o. -----	Hylemyia brassicae Bouche
Cabbage webworm a.n.o. -----	Hellula undalis Fab.
California red scale a.n.o. -----	Chrysomphalus aurantii Mask.
Carbium curculio -----	Conotrachelus anaglypticus Say
Campior thrips a.n.o. -----	Cryptothrips floridensis Watson
Carrot beetle a.n.o. -----	Ligyrus gibbosus DeG.
Carrot rust fly a.n.o. -----	Psila rosae Fab.
Catalpa leaf miner -----	Agromyza citreifrons Mall.
Catalpa mealybug -----	Pseudococcus comstocki Kuw.
Catalpa sphinx a.n.o. -----	Ceratonia catalpae Bdv.
Chaff scale a.n.o. -----	Parlatoria pergandii Comst.
Changa a.n.o. -----	Scapteriscus vicinus Scudd.
Cherry fruit fly a.n.o. -----	Rhagoletis cingulata Loew
Cherry fruit worm a.n.o. -----	Grapholitha packardii Zell.
Cherry leaf beetle a.n.o. -----	Galerucella cavicollis Lec.
Cherry scale a.n.o. -----	Aspidiotus forbesi Johns.
Chigger a.n.o. -----	Trombicula irritans Riley
Chinch bug a.n.o. -----	Blissus leucopterus Say
Chinese mantis a.n.o. -----	Tenodera sinensis Sauss.
Chrysanthemum gall midge a.n.o. -----	Diarthronomyia hypogaea Loew
Cigarette beetle a.n.o. -----	Lasioderma serricorne Fab.
Citrus mealybug a.n.o. -----	Pseudococcus citri Risso
Citrus red mite a.n.o. -----	Paratetranychus citri McG.
Citrus root weevil -----	Pachnaeus litus Germ.
Citrus rust mite a.n.o. -----	Phyllocoptes oleivorus Ashm.
Citrus whitefly a.n.o. -----	Dialeurodes citri Riley & How.
Clear-winged grasshopper a.n.o. -----	Cannula pellucida Scudd.
Cloudless sulphur -----	Catopsilia eubule L.
Clover leaf weevil a.n.o. -----	Hypera punctata Fab.
Codling moth a.n.o. -----	Carpocapsa pomonella L.
Colorado corn root worm -----	Diabrotica virgifera Lec.
Colorado potato beetle a.n.o. -----	Leptinotarsa decemlineata Say

Common cattle grub a.n.o. -----	<i>Hypoderma lineatum</i> DeVill.
Common red spider a.n.o. -----	<i>Tetranychus telarius</i> L.
Convergent ladybeetle a.n.o. -----	<i>Hippodamia convergens</i> Guer.
Corn blotch leaf miner a.n.o. -----	<i>Agromyza parvicornis</i> Loew
Corn ear worm a.n.o. -----	<i>Heliothis obsoleta</i> Fab.
Corn leaf aphid a.n.o. -----	<i>Aphis maidis</i> Fitch
Cotton aphid a.n.o. -----	<i>Aphis gossypii</i> Glov.
Cotton flea hopper a.n.o. -----	<i>Psallus seriatus</i> Reut.
Cotton leaf worm a.n.o. -----	<i>Alabama argillacea</i> Hbn.
Cotton square borer a.n.o. -----	<i>Styrmon melinus</i> Hbn.
Cottonwood leaf miner -----	<i>Zeugophora scutellaris</i> Suffr.
Cottonwood scale -----	<i>Chionaspis ortholobis</i> Comst.
Cottony-cushion scale a.n.o. -----	<i>Icerya purchasi</i> Mask.
Cottony maple scale a.n.o. -----	<i>Pulvinaria vitis</i> L.
Coulee cricket a.n.o. -----	<i>Paranabrus scabricollis</i> Thos.
Cowpea aphid a.n.o. -----	<i>Aphis medicaginis</i> Koch
Cowpea curculio a.n.o. -----	<i>Chalcodermus aeneus</i> Boh.
Crapemyrtle aphid a.n.o. -----	<i>Myzocallis kahawaluokalani</i> Kirk.
Cross-striped cabbage worm a.n.o. -----	<i>Evergestis rimosalis</i> Guen.
Cuban-laurel thrips a.n.o. -----	<i>Gynaikothrips uzeli</i> Zimm.
Current aphid a.n.o. -----	<i>Myzus ribis</i> L.
Current stem girdler a.n.o. -----	<i>Janus integer</i> Mort.
Cyclamen mite a.n.o. -----	<i>Tarsonemus pallidus</i> Bks.
Deodar weevil a.n.o. -----	<i>Pissodes deodarae</i> Hopk.
Diamond-back moth a.n.o. -----	<i>Plutella maculipennis</i> Curt.
Dried-fruit moth a.n.o. -----	<i>Vitula serratilineella</i> Rag.
Dusky leaf roller -----	<i>Anerbia humerosana</i> Clem.
Ear tick a.n.o. -----	<i>Ornithodoros megnini</i> Duges
Early strawberry slug -----	<i>Empria fragariae</i> Rohw.
Eastern tent caterpillar a.n.o. -----	<i>Malacosoma americana</i> Fab.
Elm borer a.n.o. -----	<i>Saperda tridentata</i> Oliv.
Elm codiccomb gall a.n.o. -----	<i>Colopha ulmicola</i> Fitch
Elm leaf beetle a.n.o. -----	<i>Galerucella xanthomelaena</i> Schr.
Elm leaf miner a.n.o. -----	<i>Kaliosysphinga ulmi</i> Sund.
Elm scurfy scale a.n.o. -----	<i>Chionaspis americana</i> Johns.
Eucynus scale a.n.o. -----	<i>Chionaspis eucyni</i> Comst.
European apple sucker. See apple sucker.	
European corn borer a.n.o. -----	<i>Pyrausta nubilalis</i> Hbn.
European earwig a.n.o. -----	<i>Forficula auricularia</i> L.
European elm scale a.n.o. -----	<i>Gossyparia spuria</i> Mod.
European fruit lecanium a.n.o. -----	<i>Lecanium corni</i> Bouche
European pine shoot moth a.n.o. -----	<i>Paracronia buoliana</i> Schiff.
European red mite a.n.o. -----	<i>Paratetranychus pilosus</i> C. & F.
European spruce sawfly a.n.o. -----	<i>Neodiprion polytomum</i> Htg.
European willow beetle a.n.o. -----	<i>Flagidera versicolora</i> Laich.
Eye-spotted budmoth a.n.o. -----	<i>Spilonota ocellana</i> Schiff.
Fall armyworm a.n.o. -----	<i>Locusta frugiperda</i> S. & A.
Fall cankerworm a.n.o. -----	<i>Alecitha pomataria</i> Harr.



Fall webworm a.n.o. -----	<i>Hyphantria cunea</i> Drury
False chinch bug a.n.o. -----	<i>Myndus ericae</i> Schill.
Fern scale a.n.o. -----	<i>Hemichionaspis aspidistreae</i> Sign.
Field cricket a.n.o. -----	<i>Gryllus assimilis</i> Fab.
Filbert bud mite -----	<i>Eriophyes avellanae</i> Wal.
Fire ant a.n.o. -----	<i>Solenopsis geminata</i> Fab.
Flat-headed apple tree borer a.n.o. -----	<i>Chrysobothris femorata</i> Oliv.
Florida red scale a.n.o. -----	<i>Chrysomphalus aonidum</i> L.
Forest tent caterpillar a.n.o. -----	<i>Malacosoma disstria</i> Hbn.
Four-lined plant bug a.n.o. -----	<i>Boecilopsus lineatus</i> Fab.
Fowl tick a.n.o. -----	<i>Argas miniatus</i> Koch
Fruit tree leaf roller a.n.o. -----	<i>Cacoecia argyrospila</i> Walk.
Garden centipede a.n.o. -----	<i>Scutigera immaculata</i> Newp.
Garden flea hopper a.n.o. -----	<i>Halticus citri</i> Ashm.
Garden slug -----	<i>Agriolimax agrestis</i> L.
Garden springtail a.n.o. -----	<i>Bourletiella hortensis</i> Fitch
Garden webworm a.n.o. -----	<i>Loxostege similalis</i> Guen.
Giant aphid -----	<i>Longistigma caryae</i> Harr.
Gladiolus thrips a.n.o. -----	<i>Maclothrips gladioli</i> N. & S.
Gloomy scale a.n.o. -----	<i>Chrysomphalus tenebriosus</i> Comst.
Golden oak scale -----	<i>Asterolecanium variolosum</i> Ratz.
Grape berry moth a.n.o. -----	<i>Polychorosis viteana</i> Clem.
Grape colaspis a.n.o. -----	<i>Colaspis brunea</i> Fab.
Grape leafhopper a.n.o. -----	<i>Erythroneura comes</i> Say
Grape root worm a.n.o. -----	<i>Fidia viticida</i> Walsh
Grape scale a.n.o. -----	<i>Aspidiotus uvae</i> Comst.
Grapevine hoplia -----	<i>Hoplia calliope</i> Lec.
Grass thrips a.n.o. -----	<i>Anaphothrips obscurus</i> Mull.
Gray-banded leaf roller a.n.o. -----	<i>Eulia mariana</i> Fern.
Gray sugarcane mealybug -----	<i>Pseudococcus bonensis</i> Kuw.
Green bug a.n.o. -----	<i>Toxoptera graminum</i> Rond.
Green citrus aphid -----	<i>Aphis spiraeicola</i> Patch
Green clover worm a.n.o. -----	<i>Plathypena scabra</i> Fab.
Green fruit worm a.n.o. -----	<i>Graptolitha antennata</i> Walk.
Greenhouse leaf tier a.n.o. -----	<i>Phlyctaenia rubigalis</i> Guen.
Green June beetle a.n.o. -----	<i>Cotinis nitida</i> L.
Green peach aphid a.n.o. -----	<i>Myzus persicae</i> Sulz.
Green scale a.n.o. -----	<i>Coccus viridis</i> Green
Green stinkbug a.n.o. -----	<i>Acrosternum hilaris</i> Say
Green-striped maple worm a.n.o. -----	<i>Anisota rubicunda</i> Fab.
Gulf coast tick a.n.o. -----	<i>Amblyomma maculatum</i> Koch
Gypsy moth a.n.o. -----	<i>Porthotria dispar</i> L.
Half-winged geometer -----	<i>Phigalia titea</i> Cram.
Harlequin bug a.n.o. -----	<i>Murgantia histrionica</i> Hahn
Hawaiian beet webworm a.n.o. -----	<i>Hymenia fascialis</i> Cram.
Hemlock spanworm a.n.o. -----	<i>Ellopiia fuscicollis</i> Guen.
Hessian fly a.n.o. -----	<i>Phytophaga destructor</i> Say
Hickory shuck worm a.n.o. -----	<i>Laspeyresia caryana</i> Fitch
Hog mange mite -----	<i>Sarcoptes scabiei</i> suis DeG.



Holcocera moth -----	Holcocera iceryaeella Riley
Holly leaf miner a.n.o. -----	Phytomyza ilicis Curt.
Horn fly a.n.o. -----	Haematobia irritans L.
Horned oak gall -----	Andricus cornigerus O. S.
Horned squash bug -----	Anasa armigera Say
Horse-radish flea beetle a.n.o. -----	Phyllotreta armoraciae Koch
House cricket a.n.o. -----	Gryllus domesticus L.
Human flea a.n.o. -----	Pulex irritans L.
Imported cabbage worm a.n.o. -----	Ascia rapae L.
Indian-meal moth a.n.o. -----	Plodia interpunctella Hbn.
Introduced pine sawfly a.n.o. -----	Diprion simile Htg.
Iris borer a.n.o. -----	Macronoctua onusta Grote
Iris thrips a.n.o. -----	Bregmatothrips iridis Watson
Japanese beetle a.n.o. -----	Popillia japonica Newm.
Japanese maple scale -----	Leucaspis japonica Chll.
Juniper webworm -----	Dichomeris marginellus Fab.
Larch case bearer a.n.o. -----	Coleophora laricella Hbn.
Larch sawfly a.n.o. -----	Lygaeonematus erichsonii Htg.
Lead cable borer a.n.o. -----	Scobicia declivis Lec.
Leaf-footed bug a.n.o. -----	Leptoglossus phyllopus L.
Lesser bulb fly a.n.o. -----	Eumerus tuberculatus Rond.
Lesser corn stalk borer a.n.o. -----	Elasmopalpus lignosellus Zell.
Lesser migratory grasshopper -----	Melanoplus mexicanus Sauss.
Lesser peach borer a.n.o. -----	Aegeria pictipes G. & R.
Lily aphid -----	Myzus circumflexus Buckton
Lima bean vine borer -----	Monoptilota pergratialis Hulst
Lime tree looper a.n.o. -----	Erannia tiliaris Harr.
Locust leaf miner a.n.o. -----	Chalepus vernalis Thunb.
Long-nosed ox louse -----	Linognathus vituli L.
Magnolia scale a.n.o. -----	Neolecanium cornuparvum Thro
Maple bladder gall -----	Phyllocoptes quadripes Shin.
Margined soldier beetle -----	Chauliognathus marginatus Fab.
Meadow froghopper -----	Philaenus leucophthalmus L.
Meal moth a.n.o. -----	Pyralis farinalis L.
Mediterranean fruit fly a.n.o. -----	Ceratitidis capitata Wied.
Melon aphid a.n.o. -----	Aphis gossypii Glov.
Melon fly a.n.o. -----	Bactrocera cucurbitae Coq.
Mexican bean beetle a.n.o. -----	Epilachna corrupta Muls.
Monarch butterfly a.n.o. -----	Danaus plexippus Hbn.
Mormon cricket a.n.o. -----	Anabrus simplex Hald.
Mountain ash sawfly -----	Fristiphora banksi Marl.
Mountain pine beetle a.n.o. -----	Dendroctonus monticolae Hopk.
Mourning-cloak butterfly a.n.o. -----	Nymphalis antiopa L.
Nantucket pine shoot moth -----	Rhyacionia frustrana Comst.
Narcissus bulb fly a.n.o. -----	Noradon equestris Fab.
New York weevil a.n.o. -----	Ithycerus noveboracensis Forst.
Norway maple aphid a.n.o. -----	Periphyllus lyropictus Kess.

Oak pill gall -----	Cincticornia pilulae Walsh
Oak rosette gall -----	Cynips frondosa Bass.
Oak twig pruner -----	Hypermallus villosus Fab.
Oblique-banded leaf roller a.n.o. -----	Cacoecia rosaceana Harr.
Oblong leaf weevil -----	Phyllobius oblongus L.
Obscure scale a.n.o. -----	Chrysomphalus obscurus Comst.
Odorous house ant a.n.o. -----	Tapinoma sessile Say
Oleander aphid -----	Aphis nerii Fonscol.
Onion maggot a.n.o. -----	Hylemyia antiqua Meig.
Onion thrips a.n.o. -----	Thrips tabaci Lind.
Orange-striped oak worm a.n.o. -----	Anisota senatoria S. & A.
Orange tortrix a.n.o. -----	Tortrix citrana Fern.
Oriental fruit moth a.n.o. -----	Grapholitha molesta Busck
Oriental rat flea a.n.o. -----	Xenopsylla cheopsis Rothsch.
Oyster-shell scale a.n.o. -----	Lepidosaphes ulmi L.
Pacific coast wireworm -----	Phaeletes canus Lec.
Pacific red spider -----	Tetranychus pacificus McG.
Painted hicory borer -----	Cyllene caryae Gahan
Painted lady a.n.o. -----	Cynthia cardui L.
Pajaroello -----	Ornithodoros coriaceus Koch
Pale-striped flea beetle a.n.o. -----	Systema taeniata blanda Melsh.
Pale western cutworm a.n.o. -----	Porosagrotis orthogonia Morr.
Pales weevil -----	Hylobius pales Boh.
Papaya fruit fly a.n.o. -----	Toxotrypana curvicauda Gerst.
Paralysis tick. See Rocky Mountain spotted fever tick.	
Pea aphid a.n.o. -----	Illinois pisi Kalt.
Pea weevil a.n.o. -----	Bruchus pisorum L.
Peach borer a.n.o. -----	Aegeria exitiosa Say
Peach twig borer a.n.o. -----	Anarsia lineatella Zell.
Pear leaf blister mite a.n.o. -----	Eriophyes pyri Pgst.
Pear midge a.n.o. -----	Contarinia pyrivora Riley
Pear psylla a.n.o. -----	Psyllia pyricola Foerst.
Pear slug a.n.o. -----	Eriocampoides limacina Retz.
Pear thrips a.n.o. -----	Taeniothrips inconsequens Uzel
Pecan carpenter worm -----	Cossula magnifica Stkr.
Pecan budmoth a.n.o. -----	Gretchena bolliana Sling.
Pecan leaf case bearer -----	Acrobasis juglandis LeB.
Pecan phylloxera -----	Phylloxera devastatrix Perg.
Pecan weevil a.n.o. -----	Curculio caryae Horn
Pepper weevil a.n.o. -----	Anthonomus eugenii Cano
Periodical cicada a.n.o. -----	Magicicada septendecim L.
Pharaoh's ant a.n.o. -----	Monomorium pharaonis L.
Pigeon tremex a.n.o. -----	Tremex columba L.
Pine bark aphid a.n.o. -----	Pincus strobil Htg.
Pine butterfly a.n.o. -----	Neophasia menapia Feld.
Pine needle miner -----	Recurvaria milleri Busck
Pine needle scale a.n.o. -----	Chionaspis pinifoliae Fitch
Pink bollworm a.n.o. -----	Pectinophora gossypiella Saund.
Pistol case bearer a.n.o. -----	Coleophora malivorella Riley
Plum curculio a.n.o. -----	Conotrachelus nemophar Hbst.



Poplar leaf-stem gall -----	<i>Pemphigus gonuli-transversus</i> Riley
Potato aphid a.n.o. -----	<i>Illinoia solanifolia</i> Asm.
Potato flea beetle a.n.o. -----	<i>Epitrix cucumeris</i> Harr.
Potato leafhopper a.n.o. -----	<i>Empoasca fabae</i> Harr.
Potato stalk borer a.n.o. -----	<i>Trichobaris trinotata</i> Say
Potato tuber worm a.n.o. -----	<i>Gnominoschema operculella</i> Zell.
Punkies -----	<i>Culicoides</i> spp.
Purple scale a.n.o. -----	<i>Lepidosaphes beckii</i> Newm.
Russ caterpillar a.n.o. -----	<i>Megalopis opercularis</i> S. & A.
Putnam's scale a.n.o. -----	<i>Aspidiotus ancylus</i> Putn.
Quince curculio a.n.o. -----	<i>Conotrachelus crataegi</i> Walsh
Rain-barrel mosquito -----	<i>Culex pipiens</i> L.
Rapid plant bug a.n.o. -----	<i>Adelphocorus rapidus</i> Say
Raspberry cane borer a.n.o. -----	<i>Obreca bimaculata</i> Oliv.
Red-backed cutworm a.n.o. -----	<i>Euxoa ochrogaster</i> Guen.
Redbud aphid -----	<i>Aphis pavneepae</i> Hottes
Red turnip beetle a.n.o. -----	<i>Entomoscelis adonidis</i> Pal.
Rhododendron whitefly -----	<i>Dialeurodes chittendeni</i> Laing
Ribbed cocoon maker -----	<i>Bucculatrix pomifoliella</i> Clem.
Rice stinkbug -----	<i>Solubea pagnax</i> Fab.
Rice water weevil a.n.o. -----	<i>Lissorhoptrus simplex</i> Say
Rice weevil a.n.o. -----	<i>Sitophilus oryzae</i> L.
Rocky Mountain spotted fever tick -----	<i>Dermacentor andersoni</i> Stiles
Rose aphid a.n.o. -----	<i>Macrosiphum rosae</i> L.
Rose chafer a.n.o. -----	<i>Macrolactylus subspinosus</i> Fab.
Rose curculio a.n.o. -----	<i>Rhynchites bicolor</i> Fab.
Rose leaf beetle a.n.o. -----	<i>Modonota puncticollis</i> Say
Rose sawfly a.n.o. -----	<i>Caliroa aethiops</i> Fab.
Rosy apple aphid a.n.o. -----	<i>Anuraphis roseus</i> Balz.
Roundheaded apple tree borer a.n.o. -----	<i>Saperda candida</i> Fab.
Rusty plum aphid a.n.o. -----	<i>Hysteroneura setariae</i> Thos.
Saddle-back caterpillar a.n.o. -----	<i>Sibine stimulea</i> Clem.
Salmon fly -----	<i>Taeniopteryx pacifica</i> Bks.
Salt-marsh caterpillar a.n.o. -----	<i>Estigmene acraea</i> Drury
San Jose scale a.n.o. -----	<i>Aspidiotus perniciosus</i> Comst.
Satin moth a.n.o. -----	<i>Stilpnotia salicis</i> L.
Saw-toothed grain beetle a.n.o. -----	<i>Oryzaephilus surinamensis</i> L.
Say's blister beetle a.n.o. -----	<i>Pomphoxea sayi</i> Lec.
Say's stinkbug a.n.o. -----	<i>Chlorochroa sayi</i> Stahl
Scotch pine scale -----	<i>Toumeyella numismaticum</i> Pettit & McDaniel
Screw worms -----	<i>Cochliomyia</i> spp.
Scurfy scale a.n.o. -----	<i>Chionaspis furfura</i> Fitch
Seed corn maggot a.n.o. -----	<i>Eylemyia cilicrura</i> Rond.
Sheep botfly a.n.o. -----	<i>Oestrus ovis</i> L.
Short-nosed cattle louse a.n.o. -----	<i>Haematopinus eurysterus</i> Nitz.
Shot-hole borer a.n.o. -----	<i>Scolytus rugulosus</i> Ratz.
Snowball aphid a.n.o. -----	<i>Aphis viburnicola</i> Gill.
Soft scale a.n.o. -----	<i>Coccus hesperidum</i> L.
Sorghum webworm a.n.o. -----	<i>Celana sorghiella</i> Riley
Southern cabbage worm a.n.o. -----	<i>Ascia protodice</i> B. & L.



Southern corn root worm a.n.o. -----	<i>Diabrotica duodecimpunctata</i> Fab.
Southern corn stalk borer a.n.o. -----	<i>Diatraea crambidoides</i> Grote
Southern green stinkbug a.n.o. -----	<i>Nezara viridula</i> L.
Southern pine beetle a.n.o. -----	<i>Dendroctonus frontalis</i> Zimm.
Spiny rose gall -----	<i>Rhodites bicolor</i> Harr.
Spirea aphid -----	<i>Aphis spiraeicola</i> Patch
Spotted cucumber beetle a.n.o. -----	<i>Diabrotica duodecimpunctata</i> Fab.
Spring cankerworm a.n.o. -----	<i>Paleacrita vernata</i> Peck
Spruce bud scale -----	<i>Physokermes piceae</i> Schr.
Spruce budworm a.n.o. -----	<i>Harmoloba funiferana</i> Glen.
Spruce gall aphid -----	<i>Chermes abietis</i> L.
Spruce leaf miner -----	<i>Securvaria piceaella</i> Kearf.
Squash bug a.n.o. -----	<i>Anasa tristis</i> DeG.
Stable fly a.n.o. -----	<i>Stomoxys calcitrans</i> L.
Stalk borer a.n.o. -----	<i>Papaipema nebris nitela</i> Guen.
Sticktight flea a.n.o. -----	<i>Echidnophaga gallinacea</i> Westw.
Strawberry leaf roller a.n.o. -----	<i>Ancyliis comptana</i> Froel.
Strawberry root aphid a.n.o. -----	<i>Aphis forbesi</i> Weed
Strawberry root weevil a.n.o. -----	<i>Brachyrhinus ovatus</i> L.
Strawberry weevil a.n.o. -----	<i>Anthonomus signatus</i> Say
Striped blister beetle a.n.o. -----	<i>Epicauta vittata</i> Fab.
Striped cucumber beetle a.n.o. -----	<i>Diabrotica vittata</i> Fab.
Striped flea beetle a.n.o. -----	<i>Phyllotreta vittata</i> Fab.
Sugar beet root maggot -----	<i>Tetanops aldrichi</i> Hendel
Sugar beet wireworm a.n.o. -----	<i>Pholetes californicus</i> Mann.
Sugarcane beetle a.n.o. -----	<i>Eutheola rugiceps</i> Lec.
Sugarcane borer a.n.o. -----	<i>Diatraea saccharalis</i> Fab.
Sugarcane rootstock weevil -----	<i>Anacentrinus subnudus</i> Buchanan
Sumac beetle -----	<i>Blepharida rhois</i> Forst.
Sunflower weevil -----	<i>Rhodoabaenus tredecimpunctatus</i> Ill.
Sweetpotato flea beetle a.n.o. -----	<i>Chaetocnema confinis</i> Crotch
Sweetpotato hornworm a.n.o. -----	<i>Herse cingulata</i> Fab.
Sweetpotato leaf beetle -----	<i>Typophorus viridicyaneus</i> Crotch
Sweetpotato sawfly -----	<i>Sterictiphora cellularis</i> Say
Sweetpotato weevil a.n.o. -----	<i>Cylas formicarius</i> Fab.
Sycamore lacebug -----	<i>Corythucha ciliata</i> Say
Sycamore scale -----	<i>Stomacoccus platani</i> Ferris
Tarnished plant bug a.n.o. -----	<i>Lygus pratensis</i> L.
Three-cornered alfalfa hopper -----	<i>Stictocephala festina</i> Say
Thurberia weevil a.n.o. -----	<i>Anthonomus grandis thurberiae</i> Pierce
Tiger swallowtail a.n.o. -----	<i>Papilio glaucus turmus</i> L.
Tobacco budworm a.n.o. -----	<i>Heliothis virescens</i> Fab.
Tobacco flea beetle a.n.o. -----	<i>Epitrix parvula</i> Fab.
Tobacco moth a.n.o. -----	<i>Ephestia elutella</i> Hbn.
Tobacco thrips a.n.o. -----	<i>Frankliniella fusca</i> Hinds
Tobacco worm a.n.o. -----	<i>Phlegethontius quinque maculata</i> Haw.
Tomato pinworm a.n.o. -----	<i>Gnorimoschena lycopersicella</i> Busck
Tomato psyllid -----	<i>Paratrioza cockerelli</i> Sulc.
Tomato stiltbug -----	<i>Jalysus spinosus</i> Say
Tomato worm a.n.o. -----	<i>Phlegethontius sexta</i> Johan.
Tropical rat mite a.n.o. -----	<i>Liponyssus bacoti</i> Hirst.

Tulip aphid -----	Rhopalosiphoninus tulipella Theob.
Tulip tree scale a.n.o. -----	Toumeyella liriodendri Gmel.
Turnip aphid a.n.o. -----	Rhopalosiphum pseudobrassicae Davis
Trice-stabbed ladybeetle a.n.o. -----	Chilocorus bivelvenerus Muls.
Trig girder a.n.o. -----	Oncideres cingulatus Say
Two-marked treehopper -----	Enchenopa binotata Say
Two-striped grasshopper a.n.o. -----	Melanoplus bivittatus Say
Variegated cutworm a.n.o. -----	Lycophotia margaritosa saucia Hbn.
Velvet a.n.o. -----	Edollia cardinalis Muls.
Vegetable weevil a.n.o. -----	Listroderes obliquus Gyll.
Velvetbean caterpillar a.n.o. -----	Anticarsia gemmatilis Hbn.
Vetch bruchid -----	Bruchus brachialis Fahraeus
Walnut caterpillar a.n.o. -----	Datana integerrima G. & R.
Walnut scale a.n.o. -----	Aspidiotus juglans-regiae Comst.
Water-oak scale -----	Lecanium quercifex Fitch
Western pine beetle a.n.o. -----	Dendroctonus brevicornis Lec.
Western spotted cucumber beetle a.n.o. -	Diabrotica soror Lec.
Wheat stem maggot a.n.o. -----	Meromyza americana Fitch
Wheat stem sawfly a.n.o. -----	Cephus cinctus Nort.
Wheel bug a.n.o. -----	Arilus cristatus L.
White apple leafhopper a.n.o. -----	Typhlocyba pomaria McAtee
White-lined sphinx a.n.o. -----	Sphinx lineata Fab.
White-marked tussock moth a.n.o. -----	Homocampa leucostigma S. & A.
White oak club gall -----	Andricus clavulus O.S.
White peach scale a.n.o. -----	Aulacaspis pentagona Targ.
White spruce sawfly. See European spruce sawfly.	
Winter tick a.n.o. -----	Dermacentor albipictus Pack.
Woolly alder aphid a.n.o. -----	Prociphilus tessellatus Fitch
Woolly apple aphid a.n.o. -----	Eriosoma lanigerum Hausm.
Woolly beech aphid -----	Phylloxera fagi L.
Woolly elm aphid a.n.o. -----	Eriosoma americanum Riley
Yellow-fever mosquito a.n.o. -----	Aedes aegypti L.
Yellow-headed spruce sawfly a.n.o. -----	Pachymenatus ocreatus Harr.
Yellow-necked caterpillar a.n.o. -----	Datana ministra Drury

1. The first part of the paper is devoted to a general discussion of the problem of the origin of life. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the origin of life, and shows that the most plausible is the theory of spontaneous generation.

2. The second part of the paper is devoted to a discussion of the problem of the evolution of life. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the evolution of life, and shows that the most plausible is the theory of natural selection.

3. The third part of the paper is devoted to a discussion of the problem of the development of life. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the development of life, and shows that the most plausible is the theory of the development of life.

4. The fourth part of the paper is devoted to a discussion of the problem of the future of life. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the future of life, and shows that the most plausible is the theory of the future of life.

5. The fifth part of the paper is devoted to a discussion of the problem of the origin of man. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the origin of man, and shows that the most plausible is the theory of the origin of man.

6. The sixth part of the paper is devoted to a discussion of the problem of the future of man. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the future of man, and shows that the most plausible is the theory of the future of man.

7. The seventh part of the paper is devoted to a discussion of the problem of the origin of the universe. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the origin of the universe, and shows that the most plausible is the theory of the origin of the universe.

8. The eighth part of the paper is devoted to a discussion of the problem of the future of the universe. It is shown that the problem is one of the most important and most difficult in the history of science. The author discusses the various theories of the future of the universe, and shows that the most plausible is the theory of the future of the universe.

















